

ROYAL BOTANIC GARDENS, KEW.

## BULLETIN

OF

## MISCELLANEOUS INFORMATION.

No. 10]

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## LXV.—HERDERIA AND TRIPLLOTAXIS.

J. HUTCHINSON.

(With Plate.)

The genus *Herderia* (*Compositae*), was founded by Cassini\* in 1830 on a specimen collected in Senegambia, and preserved in the herbarium of M. Mèrat, Paris. The species, which he called *Herderia truncata*, is now known to be fairly widely spread in Tropical West Africa, occurring from the Senegal southward to Nigeria. A typical shoot of *H. truncata* is depicted on the plate, fig. A. The plant when mature is of a procumbent straggly habit with numerous weak branches radiating from an erect slender root, and the capitula are solitary at the ends of the leafy shoots. The involucre is very remarkable in the tribe *Vernonieae*, in that it consists only of two series of bracts, an outer one the bracts of which are foliaceous and free from one another (fig. 1 and 1a), and an inner row of membranous ones connate to above the middle (fig. 1). The achenes (fig. 2) are very strongly 4-ribbed and glabrous, and they support a pappus (figs. 3 and 4) arranged in two distinct series, a series of 9-10 small subpaleaceous scales with a series of 3-4 longer barbellate setae intermixed.

In 1849 a second species, *H. stellulifera*, was described by Benth† from material collected by Vogel in the island of Fernando Po. A portion of a plant of this species is shown in the plate (fig. B). The capitula are arranged in lax corymbs and are supported on slender peduncles; the involucre is quite of the *Vernonia* character, i.e., of about three series of bracts all quite free from one another and amongst themselves, and not at all foliaceous (fig. 6); the achenes (fig. 7) are terete and hairy, and the pappus is 1-seriate and represented by a very small pectinately toothed cup (fig. 8).

Comparison of habit and floral dissections, together with the widely different structure of the involucre, make it clear that the two species represent perfectly distinct genera.

\* Cass. Dict. Sci. Nat. lx. 599.

† Benth. in Hook. Niger Flora, 425.

Quite recently two additional species have been added to the genus, one of which, *H. lancifolia*, O. Hoffm.,\* from the Belgian Congo, is undoubtedly congeneric with *H. truncata*; the other, *H. somalensis*, O. Hoffm.,† from Somaliland, having all the generic characters of *H. stellulifera*.

Hoffmann (Engl. l.c.) considered the differences in his Somaliland species to be insufficient for segregation as a separate genus from *Herderia truncata*. But his conclusions seem to have been based entirely on the distinctions of the pappus, and not on the structure of the involucre, which he appears to have overlooked. Consequently I have little diffidence in making *H. stellulifera*, Benth., and *H. somalensis*, O. Hoffm., the types of a new genus, for which the name *Triplotaxis* is proposed, in reference to the number of series of the involucral bracts. *Herderia*, as thus restricted, and the new genus are described in the following.

**Herderia**, Cass. Dict. Sci. Nat. lx. 599; DC. Prodr. v. 13; Benth. et Hook. f. Gen. Pl. ii. 232 (partim); O. Hoffm. in Engl. Pflanzenfam. iv. 5, p. 127 (partim).

*Capitula* homogama, tubuliflora. *Involucrum* campanulatum, e bracteis biseriatis constitutum, exterioribus foliaceis liberis, interioribus in tubum lobatum membranaceum connatis. *Receptaculum* concavum, nudum. *Corollae* aequales, regulares, tubo superne dilatato, limbo 5-lobato. *Styli* rami lineares, obtusi. *Achaenia* leviter obliqua, 4-angulata, apice truncata. *Pappi* setae circiter 5-9, breves, subpaleaceae, setis barbellatis 3-5 longioribus intermixtis—*Herbae* e basi ramosae, ramis plerumque plus minusve procumbentibus. *Folia* alterna, breviter petiolata, dentata vel integra. *Capitula* mediocria, solitaria, ramos foliatis terminantia. *Flores* rubri vel purpurei.

Species 2, Africae tropicae incolae.

*Folia* spatulato-obovata vel oblongo-oblan-  
ceolata, apice truncata vel rotundata, parce  
dentata, plerumque tenuiter pubescentia  
vel villosa; achaenia glabra ... (1) *H. truncata*.

*Folia* lanceolata, acutissima, integra, glabra;  
achaenia pilosa ... (2) *H. lancifolia*.

1. ***H. truncata***, Cass. Dict. Sci. Nat. lx. 586 et 599; DC. Prodr. v. 13, includ. vars. *adscendens*, *multicaulis* et *leptorhiza*; Oliv. et Hiern in Oliv. Fl. Trop. Afr. iii. 298.

*Amphirephes senegalensis*, Less. in Linnaea vi. 687.

*Herba* e basi ramosa; rhizoma erectum, elongatum, gracile; caules numerosi, procumbentes vel ascendentes, subsimplices vel ramosi, plus minusve cano-pubescentes. *Folia* spatulato-obovata vel oblongo-oblan-  
ceolata, basi angustata, superne rotundata vel subtruncata, parce dentata, usque ad 4 cm. longa et 1.5 cm. lata, membranacea, plerumque tenuiter pubescentia, subtus glandulis numerosis instructa; nervi laterales utrinque 3-4, arcuati, vix conspicui. *Capitula* campanulata, circiter 6 mm. longa et diametro. *Involucra* bractearum exteriores foliaceae, oblanceolatae,

\* Bull. Soc. Bot. Belg. xl. 22 (1901).

† Engl. Bot. Jahrb. xxxviii. 199, t. 1 (1906).



obtusae, 2.5–4 mm. longae, 1–1.5 mm. latae, virides, utrinque punctatae, interdum parce pubescentes; bracteae series interioris supra medium in tubum campanulatum connatae; tubus 1.5 mm. longus, extra parce puberulus; lobi oblongo-lanceolati, subacuti, 2 mm. longi, 1 mm. lati, extra longe pubescentes, ciliati. *Flores* rubri, circiter 20. *Corollae* tubus clavatus, basi cylindricus, superne ampliatus, 1.75 mm. longus; lobi triangulari-lanceolati, subacuti, extra glandulosi. *Antherae* basi sagittatae, 1 mm. longae, apice subacutae. *Styli rami* pubescentes. *Achaenia* 4 mm. longa, 1.25 mm. lata, prominenter 4-angulata, glabra. *Pappi setae* breviores 0.75 mm. longae, longiores 1.5 mm. longae, albae.

Senegambia: on the banks of the Senegal River, *Perrottet!* *Lelievre!* Sébi, *Chevalier* 1165! Gold Coast: Aburi (?), *Anderson* 28! banks of the Black Volta River, near Bjury, July, *Chipp* 506! Nigeria: Yola, in a marsh, May, *Dalziel* 37! Aboh, *Barter* 308!

var. **villosa**, DC. l.c. *Folia* pilis albis appressis densissime villosa.

Senegambia: without precise locality, *Perrottet!*

De Candolle's varieties, *leptorhiza*, *ascendens* and *multicaulis*, seem to me to be merely various stages of growth dependent on habitat.

2. **H. lancifolia**, O. Hoffm. apud Dur. et De Wild. in Bull. Soc. Bot. Belg. xl. 22 (1901).

*Herbacea*, annua, caule 0.5 m. alto sulcato glabro inferne simplice, superne in ramos paucos bracteatos monocephalos diviso folioso. *Folia* satis conferta, sessilia, lanceolata, acutissima, basi obtusa, intermedia usque ad 2 cm. longa et 4 mm. lata, inferiora et superiora minora, ramea bracteiformia remota, tantum sub capitulo crebriora, trinervia, glabra. *Capitula* multiflora, pedunculata, 7 mm. alta, 12 mm. diametro, pedunculis sub apice bracteis in squamas involucri transuentibus munitis. *Involucrum* latum, squamis [pluriseriatis?] lanceolatis acutis corollas aequantibus. *Corollae* tubus puberulus; lobi lineares, glabri. *Achaenia* pilosa. *Pappi paleae* biseriatae, paleis exterioribus 5 latis irregulariter dentatis, interioribus alternantibus aequilongis angustis lanceolatis acutis fere setiformibus.—Species pappo regulariter biseriale a typo generis nonnihil recedit.

Belgian Congo: Upper Marangu, Jan., *Debeerst* 87.

I have not seen an example of this species, but from Hoffmann's description, which is reproduced above with a few modifications for facility in comparison, I have no reason to doubt that the plant is a true *Herderia*.

**Triplotaxis**, *Hutchinson*, gen. nov., ob pappum cupularem pectinatum inter *Vernonieas* distinctissimum.

*Capitula* homogama, tubuliflora. *Involucrum* subcampanulatum, e bracteis triseriatis linearibus omnibus inter se liberis constitutum. *Receptaculum* planum, nudum. *Corollae* aequales, regulares, tubo superne sensim ampliato glanduloso, limbo 5-lobato. *Antherae* basi sagittatae. *Styli rami* lineares, obtusi, pilosi. *Achaenia* teretia, apice truncata, pilosa. *Pappus* cupu-

laris, pluripectinatum divisus.—*Herbae*, caulibus ramosissimis diffusis interdum decumbentibus. *Folia* petiolata vel sessilia, ovata vel linearia, crenata vel integra. *Capitula* parvula, in corymbos laxos foliis remotos disposita. *Flores* violacei.

Species 2, Africae tropicae incolae.

*Folia* petiolata, ovata vel ovato-lanceolata,

crenulata ... .. (1) *T. stellulifera*.

*Folia* sessilia, linearia, integra ... .. (2) *T. somalensis*.

1. *T. stellulifera*, Hutchinson, comb. nov.

*Herderia stellulifera*, Benth. in Hook. Niger Flora, 425; Oliv. et Hiern in Oliv. Fl. Trop. Afr. iii. 298; Hiern in Cat. Afr. Pl. Welw. i. 540.

*Caulis* herbaceus, ramosissimus, diffusus, decumbens, crispouterulus. *Folia* petiolata, ovata vel ovato-lanceolata, basi breviter cuneata, apice acuta vel subacuta, 2-5.5 cm. longa, 1-3.5 cm. lata, crenulata vel subintegra, membranacea vel tenuiter chartacea, utrinque crispatis pubescentia vel supra fere glabra; nervi laterales utrinque 4-5, leviter arcuati, venis laxis vix conspicuis; petioli usque ad 1 cm. longi, pubescentes. *Corymbi* laxi ramosi, paucicephali; pedunculi graciles, ad 1 cm. longi, sulcati, breviter pubescentes. *Capitula* obconico-campanulata, circiter 3 mm. lata. *Involucri bracteae* triseriatae, extra pubescentes, series exterioris subulatae, acutae, 1 mm. longae, interioris anguste lanceolatae, ad 2.5 mm. longae, margine anguste membranaceae. *Corollae* tubus e basi sensim ampliatus, 1 mm. longus, parce glandulosus, inferne tenuiter pilosus; lobi triangulari-ovati. *Antherae* basi leviter sagittatae. *Achaenia* 1.5 mm. longa, parce pilosa. *Pappus* vix 1 mm. altus, multifidus.

Sierra Leone: Welwitsch 3519! open places in bush at Heddle's Farm, Dec., Scott Elliot 3933! Nigeria: Yoruba District; Ishagama, Mar., Schlechter 12309! Fernando Po: in open cultivated places, Mar., Vogel 265! Barter! Cameroons: Bipinde, Zenker 1279! Rio del Rey, Johnston 44! Gaboon: Munda district; Sibange Farm, Soyaux 331! Sierra del Crystal, July, Mann 1679! Belgian Congo: near Stanley Pool, Aug., Hens 20! Angola: Golungo Alto, Welwitsch 3515! 3516! Pungo Andongo, Welwitsch 3518! Niamniam: Assika River, May, Schweinfurth 3163!

2. *T. somalensis*, Hutchinson, comb. nov.

*Herderia somalensis*, O. Hoffm. in Engl. Bot. Jahrb. xxxviii. 200 cum ic. (1907).

*Caulis* fruticosus, ramosus, ramis divaricatis teretibus usque ad apicem foliosis tomentellis. *Folia* sessilia, linearia, acutissima, 1.5-5 cm. longa, 2-3.5 mm. lata, integra, chartacea, supra tenuiter villosa, demum fere glabra, infra persistenter incanolanata; nervi haud conspicui. *Corymbi* paucicephali; pedunculi graciles, usque ad 2 cm. longi, pubescentes. *Capitula* subcampanulata, 6-7 mm. alta, 13-14 mm. diametro. *Involucri bracteae* circiter triseriatae, subulato-lanceolatae vel oblongo-lanceolatae, acutae, usque ad 6 mm. longae, extra pubescentes. *Corolla* violacea; tubus anguste cylindricus, 6-7 mm. longus, extra appresse pubescens; lobi lineares vel lineari-lanceolati, subacuti,



3.5 mm. longi, extra puberuli. *Antherae* apice breviter exsertae. *Achaenia* oblonga, leviter 5-gona, apice late truncata, pubescentia. *Pappus* cupularis vel subpatelliformis, pectinatim multo-divisus.

Somaliland: Ogadén, Dec., *Riva* 19! between Dagage and Gobeli, May, *Ellenbeck* 1013!

#### EXPLANATION OF PLATE.

##### A. Shoot of *Herderia truncata*, Cass.

Fig. 1, involucre of same, showing the 2 series of bracts, the inner connate.

„ 1a, one of the free outer foliaceous bracts.

„ 2, flower.

„ 3, longer seta of pappus.

„ 4, shorter seta of pappus.

„ 5, style.

##### B. Shoot of *Triplotaxis stellulifera*, Hutchinson.

Fig. 6, involucre of same.

„ 6a, three involucreal bracts, one of each series.

„ 7, flower.

„ 8, part of pappus.

„ 9, base of achene.

„ 10, style.

Dissections variously enlarged.

## LXVI.—FUNGI EXOTICI: XIX.

All the specimens described were collected by Mrs. Burkill in the Botanic Gardens, Singapore, and were accompanied by coloured drawings and notes prepared by the collector.

#### AGARICACEAE.

##### *Lepiota semivestita*, *Massee*.

*Pileus* e conico-campanulato expansus, subumbonatus, centro squamuloso-squarrosus, marginem versus glabrescens, carneo-vinosus, expallens, 2 cm. latus. *Lamellae* confertae, albidae, liberae. *Stipes* aequalis, cavus, fibrillosus, carneolus, 4–5 cm. longus, 2 mm. crassus; annulus distans, membranaceus, persistens. *Sporae* obliquae, ellipticae, hyalinae,  $5 \times 3 \mu$ .

SINGAPORE. On the ground, *E. M. Burkill* 142, 143.

Allied to *Lepiota caryophylla*, Berk. & Broome, a Ceylon species.

##### *Lepiota carneo-rubra*, *Massee*.

*Pileus* carnosulus, e convexo-campanulato expansus, subgibbosus, squamulosus, carneo-ruber, marginem versus pallidior, 3–4 cm. latus. *Lamellae* liberae, confertae, candidae, postice annulato-conjunctae, angustae. *Stipes* aequalis, fistulosus, fibrillosus, pileo concolor, 6–7 cm. longus, 3–4 mm. crassus; annulus flocculosus, albido-carneus. *Sporae* ellipticae, hyalinae,  $6 \times 4 \mu$ . Basidia clavata,  $30 \times 7$ – $5 \mu$ .

SINGAPORE. On the ground, *E. M. Burkill* 136.

Allied to *Lepiota biornata*, Berk. & Broome.

**Lepiota ochracea, Massee.**

*Pileus* conico-companulatus, explanato-umbonatus, fibrillosus, ochraceus, 2 cm. latus. *Lamellae* confertae, albiae, postice liberae, *Stipes* aequalis, fistulosus, sericeus, pileo concolor,  $3\frac{1}{4}$  cm. longus, 1-1.5 mm. crassus; annulus inferus, persistens, membranaceus. *Sporae* ellipticae, hyalinae,  $5 \times 3 \mu$ .

SINGAPORE. On the ground, *E. M. Burkill* 122.

Allied to *Lepiota adorea*, Berk & Broome, from Ceylon.

**Lepiota ferruginosa, Massee.**

*Pileus* carnosulo-membranaceus, e conico-campanulato expansus, umbonatus, striatus, squamulosus, ferruginosus, umbone obscuriore, 2-3 cm. latus. *Lamellae* confertae, angustae, albiae, liberae. *Stipes* aequalis, cavus, fibrillosus, pileo concolor vel dilutior, 4-6 cm. longus, 2-3 mm. crassus; annulus inferus, membranaceus, persistens. *Speras* non vidi.

SINGAPORE. On the ground, *E. M. Burkill* 214.

Approaching *Lepiota fulvastra*, Berk. & Curt., but differing in the superior annulus and umbonate pileus.

**Collybia altissima, Massee.**

*Pileus* carnosulus, e convexo explanatus, subumbonatus, radiato-rugulosus, glaber, umbrinus, centro saturatior, 5 cm. latus. *Lamellae* subdistantes, latae, albae, postice adnexae. *Stipes* elongatus, sursum attenuatus, laevis, glaber, strictus, solidus, deorsum griseus, sursum albidus, 14 cm. longus, 3-4 mm. crassus. *Sporae* ellipsoideae, hyalinae,  $7-8 \times 5 \mu$ .

SINGAPORE. On the ground, *E. M. Burkill* 112.

Allied to *Collybia radicata*, Fr., which differs in the rooting stem and different spores. *C. velutipes* is distinguished by its velvety stem.

**Marasmius aratus, Massee.**

*Pileus* membranaceus, convexo-hemisphericus, siccus, sulcato-striatus, rufo-purpureus, 2 cm. latus. *Lamellae* distantes, latae, postice rotundato-adnexae, carneo-tinctae. *Stipes* primo medullato-fartus, deinde fistulosus, aequalis, glaber, pileo concolor, 4 cm. longus, 1 mm. crassus. *Sporae* hyalinae, ellipsoideae,  $5 \times 3 \mu$ .

SINGAPORE. On twigs, *E. M. Burkill* 113.

Most closely allied to *Marasmius sulciceps*, Berk., from Ceylon.

**Marasmius papyraceus, Massee.**

*Pileus* membranaceus, siccus, e convexo hemispherico-depressus vel umbilicatus, sulcatus, albidus, glaber, 3-4 cm. latus. *Lamellae* confertae, angustissimae, postice emarginato-uncinatae, albiae, acie integra. *Stipes* solidus, aequalis, deorsum brunneo-tinctus, sursum albidus. *Sporae* ellipsoideae, hyalinae,  $8 \times 4-5 \mu$ .

SINGAPORE. Growing on wood, *E. M. Burkill* 121.

Growing in small clusters. Pileus very thin, dry and papery, coarsely sulcate.

Allied to *Marasmius hyperellus*, Fr.

**Entoloma umbonatum, Massee.**

*Pileus* membranaceus, e conico-campanulato subexpansus, umbonatus, fibrillosus, siccus, margine demum revoluto-fissus, 4-5 cm.



latus. *Lamellae* confertae, postice attenuato-adnexae, subventricosae, incarnatae. *Stipes* aequalis vel deorsum attenuatus, glaber, albidus, 4-5 cm. longus, 3 mm. crassus. *Sporae* ellipsoideae,  $7 \times 4 \mu$  incarnato-tinctae.

SINGAPORE. On the ground, *E. M. Burkill* 61.

Allied to *Entoloma jubatum*, Fr., but distinguished by the grey pileus and whitish stem.

***Flammula elegantula*, Massee.**

*Pileus* carnosulus, e convexo planus vel depressus, squamulosus, glabrescens, aurantio-brunneus, 4-5 cm. latus. *Lamellae* confertae, aurantiacae, postice attenuato-adnexae. *Stipes* aequalis, faretus, fibrillosus, pileo concolor, basi obscurior, 4 cm. longus, 3-4 mm. crassus. *Sporae* ellipsoideae, basi oblique apiculatae,  $7 \times 4 \mu$ .

SINGAPORE. On the ground, *E. M. Burkill* 324.

A brightly coloured fungus belonging to the section of *Flammula* of which *F. sapinea* is the type.

***Galera flexipes*, Massee.**

*Pileus* membranaceus, convexo-campanulatus, interdum subexpansus, pruinatus, glabrescens, sordide ochraceus, laevis, 1.5 cm. latus. *Lamellae* latae, subdistantes, acie fimbriata, laete ochraceae, postice rotundato-adnatae. *Stipes* flexuosus, primo fibrilloso-faretus deinde fistulosus, glaber, aequalis, pileo concolor, 4-5 cm. longus, 1 mm. crassus.

SINGAPORE. On the ground, *E. M. Burkill* 111.

Allied to *Galera stricta*, but smaller and with a slender, flexuous stem.

HYDNACEAE.

***Hydnum elatum*, Massee.**

*Pileus* carnosus, e convexo depressus, margine sinuato lobato, squamuloso-diffractus, ochraceo-incarnatus, marginem versus pallidior, 5-7 cm. latus. *Aculei* decurrentes, acuti, pallidi. *Stipes* solidus, subaequalis, pileo concolor vel pallidus, 10 cm. longus, 1 cm. crassus. *Caro* fibrosa, compacta, pallida.

SINGAPORE. On the ground, *E. M. Burkill* 183.

Remarkable for the long, stout stem. Allied to *Hydnum repandum*, Fr., which the present fungus approaches in colour. Probably edible.

## LXVII.—LORANTHUS OLEAEFOLIUS.

T. A. SPRAGUE.

In 1810 J. C. Wendland proposed a new monotypic genus, *Lichtensteinia*, distinguished from *Loranthus* by connate filaments, and hence assigned by him to the Monadelphia Monogynia.\* The type species, *Lichtensteinia oleaeifolia*, Wendl., was a parasitic plant discovered in the Prieska Division of Cape Colony by Dr. H. Lichtenstein, who travelled in South Africa during the period 1803-1806. Lichtenstein gave the following account of the species to Wendland:

\* Coll. Pl., vol. ii., pp. 4-7, t. 39 (1810).

"I found this parasitic plant in June, 1805, by the Orange River at the ford which the Carana Hottentots call Priskap.\* It grew here and there on different species of *Lycium*, and also, but less frequently, on the highest branches of *Mimosa nilotica* [*Acacia horrida*, Willd.]. Its root is woody and tuberous, always much thicker than the branch on which it grows, and which it not unfrequently surrounds, as our *Viscum* does. The branchlets are woody up to the apex, with grey bark and white wood. The largest plant had a length of a foot and a half. It was just beginning to flower, but nevertheless on my return five weeks later not a trace of fructification was to be found. The old flowers, however, were split down longitudinally and bent back. Apart from the beauty of its flowers and the strangeness of its structure, the whole growth attracted my attention all the more because it was, on account of the cold season, almost the only plant in this region which I met with in full flower."

The chief interest of the above account lies in the long period during which the corolla of this species persists. Very little is known about the duration of the corolla in the *Loranthaceae*. The petals of *Viscum nervosum*, Thunb., are persistent in fruit,† and those of *Loranthus undulatus*, E. Meyer, appear to remain on the ovary for a considerable period after fertilisation has taken place, judging from herbarium specimens.

According to Lichtenstein,‡ Willdenow reduced *Lichtensteinia*, Wendl., to *Loranthus*, but the reduction was never published. Chamisso and Schlechtendal mention, however, that *Lichtensteinia oleaefolia* is represented in Willdenow's herbarium under the name *Loranthus Lichtensteinii*.§

F. G. Dietrich reduced *Lichtensteinia* to *Loranthus* in 1818, and re-named the species *Loranthus speciosus*.|| In 1828 Chamisso and Schlechtendal accepted the reduction, and proposed the new combination *Loranthus oleaefolius*, which preserves the original specific name.§ They described a new species, *Loranthus elegans*, which had been collected at Caledons-kluft by Mund. This was said to resemble *L. oleaefolius* in habit; it differed in the glabrous corolla with spirally revolute lobes and the longer, linear anthers.

In 1830 J. A. and J. H. Schultes proposed the new name *Loranthus Schlechtendalianus* to replace *L. elegans*, Cham. & Schlecht., on account of the latter being antedated by *L. elegans*, Mart.¶ Two years previously Anton Sprengel had founded a new genus and species of *Lobeliaceae*, *Moquinia rubra*, on Zeyher's n. 296 from Uitenhage. *Moquinia* was transferred to the *Loranthaceae* by Griesselich,\*\* and *M. rubra* was reduced to *Loranthus Schlechtendalianus* by J. A. and J. H. Schultes.¶

\* The spelling Priskob is given by Lichtenstein, *Travels in S. Africa*, Engl. ed., p. 340 (1812).

† Sprague in Dyer, *Fl. Trop. Afr.*, vol. vi., sect. 1, p. 394 (1911).

‡ *Travels in S. Africa*, p. 221 (1812), footnote.

§ *Linnaea*, vol. iii., p. 209 (1828).

|| *Lexik. Gaertn. Nachtr.*, vol. iv., p. 473 (1818).

¶ Schultes, *Syst. Veg.*, vol. vii., p. 1635 (1830).

† Tent. *Suppl. Syst. Veg.*, p. 9 (1828).

\*\* *Linnaea*, vol. v., p. 421 (1830).



In 1837 Ecklon and Zeyher enumerated as *Loranthus oleaefolius* a plant collected by them in the Clanwilliam Division.\*

E. Meyer recorded *L. oleaefolius* from Little Namaqualand in 1843†; and proposed (without describing) a new species, *L. croceus*, based on specimens collected by Drège in the Clanwilliam, Prince Albert and Albany Divisions.‡

In the following year Presl reduced both *L. elegans*, Cham. & Schlecht., and *L. croceus* to *L. oleaefolius*, apparently relying on Ecklon and Zeyher's identification of the latter; he stated that the specimens which Drège had issued as *L. oleaefolius* probably represented a new species, which might be called *L. Meyeri*.§

In 1847 Drège|| reduced *L. croceus* to *L. elegans*, Cham. & Schlecht., and also referred to the latter the Clanwilliam specimens which Ecklon and Zeyher\* had enumerated as *L. oleaefolius*. According to Drège, therefore, the synonymy and distribution of *L. oleaefolius* and *L. elegans* were as follows:—

1. *Loranthus oleaefolius*, Cham. & Schlecht.—*Lichtensteinia oleaefolia*, Wendl. *Loranthus speciosus*, Dietr. *L. Lichtensteinii*, Herb. Willd.

DISTRIB. Prieska Division, *Lichtenstein*; Little Namaqualand, Drège.

2. *Loranthus elegans*, Cham. & Schlecht.—*L. croceus*, E. Meyer. *L. oleaefolius*, Eckl. & Zeyh., non Cham. & Schlecht.

DISTRIB. Caledons-kluft, *Mund*; Clanwilliam Div., Ecklon & Zeyher, Drège; Prince Albert Div., Drège; Albany Div., Drège.

In 1862, however, Harvey accepted Ecklon and Zeyher's identification of their Clanwilliam plant as *L. oleaefolius*, and founded a new species, *L. namaquensis*, on the Little Namaqualand specimens referred by E. Meyer and Drège to *L. oleaefolius*.¶ According to Harvey, the synonymy of the two species was as follows:—

1. *Loranthus namaquensis*, Harv.—*L. oleaefolius*, E. Meyer, non Cham. & Schlecht.

2. *Loranthus oleaefolius*, Cham. & Schlecht.—*Lichtensteinia oleaefolia*, Wendl. *Loranthus Lichtensteinii*, Herb. Willd. *L. elegans*, Cham. & Schlecht. *L. croceus*, E. Meyer.

Harvey's delimitation of the two species is the same as Drège's: the only point at issue is the incidence of the name *Lichtensteinia oleaefolia*, Wendl., and its synonyms. Harvey divided the South African species of *Loranthus* into two groups, the first including those with the unopened corolla cylindric or clavate, not swollen at the base nor constricted, the second comprising those with the unopened corolla strongly constricted above the urceolate or swollen base. He placed *L. oleaefolius* in the former group,

\* Enum., p. 358 (1837).

† Drège, Zwei Pfl. Docum., pp. 92 (III. B. 8), 96 (III. C. 6).

‡ Drège, l.c. 63 (II. D. 8), 139 (V. A. 39), 109 (III. E., a. 9).

§ Bot. Bemerk., pp. 75, 76 (1844).

|| Linnaea, vol. xix., p. 663 (1847).

¶ Harv. & Sond. Fl. Cap., vol. ii., pp. 575, 576 (1862).

whereas it is clear from the figure of *Lichtensteinia oleaeifolia*—which he cannot have seen—that it belongs to the latter. There can be no doubt that it is conspecific with *L. namaquensis*, Harv. Apart from the style, which is represented as filiform instead of skittle-shaped, the figure of *Lichtensteinia oleaeifolia* agrees with *Loranthus namaquensis*: the shape and indumentum of the corolla, the shape and size of the corolla-lobes and anthers, and the union of the filaments definitely preclude identification with *L. elegans*. The indumentum of the corolla of *Lichtensteinia oleaeifolia* (fig. e) agrees with Burchell's n. 1468, from the Prieska Division. The synonymy and distribution of the two species may now be stated as follows:

1. *Loranthus oleaeifolius*, Cham. & Schlecht. in *Linnaea*, vol. iii. p. 209 (1828); DC. Prodr. vol. iv. p. 304; Schultes, Syst. Veg. vol. vii. p. 1634; E. Meyer in Drège, Zwei Pfl. Docum. pp. 92 (III. B. 8), 96 (III. C. 6). *Lichtensteinia oleaeifolia*, Wendl. Coll. Pl. vol. ii. p. 4, t. 39 (1810). *Loranthus speciosus*, F. G. Dietr. Lexik. Gaertn. Nachtr. vol. iv. p. 473 (1818). *L. Lichtensteinii*, Herb. Willd. ex. Cham. & Schlecht. in *Linnaea*, vol. iii. p. 209 (1828), in syn. *L. Meyeri*, Presl. Bot. Bemerk. p. 76 (1844), nomen. *L. namaquensis*, Harv. in Harv. & Sond. Fl. Cap. vol. ii. p. 577 (1862); Sprague in Dyer, Fl. Trop. Afr. vol. vi. sect. 1, p. 361. *L. bumbensis*, Hiern in Cat. Afr. Pl. Welw. vol. i. p. 933 (1900). *Tapinanthus namaquensis*, Van Tiegh. in Bull. Soc. Bot. France, vol. xlii. p. 267 (1895).

DISTRIB. Angola, German South-West Africa, Rhodesia, Bechuanaland, Ngamiland, Little Namaqualand, Little Bushmanland, Prieska Division, Transvaal.

2. *Loranthus elegans*, Cham. & Schlecht in *Linnaea*, vol. iii. p. 209 (1828); Drège in *Linnaea*, vol. xix. p. 663. *Moquinia rubra*, A. Sprengel, Tent. Suppl. Syst. Veg. p. 9 (1828); Griesselich in *Linnaea*, vol. v. p. 421. *Loranthus Schlechtendalianus*, Schultes, Syst. Veg. vol. vii. p. 1635 (1830). *L. croceus*, E. Meyer in Drège, Zwei Pfl. Docum. p. 200 (1843), nomen. *L. glaucus*, DC. Prodr. vol. iv. p. 303, non Thunb. *L. glaucus*, var. *Burchellii*, DC. l.c. (1830). *L. oleaeifolius*, Eckl. & Zeyh. Enum. p. 358; Harv. in Harv. & Sond. Fl. Cap. vol. ii. p. 576; Benth. & Hook. f. Gen. Pl. vol. iii. p. 209; Engl. in Engl. Jahrb. vol. xx. p. 83; Engl. & Prantl, Nat. Pflanzenfam. vol. iii. 1, p. 187, t. 126, fig. L—N; non Cham. & Schlecht. *L. oleifolius*, Marloth, Fl. S. Afr. vol. i. p. 167, t. 38, fig. A. *L. speciosus*, Engl. in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. i. p. 131, non F. G. Dietr. *Lichtensteinia elegans*, Van Tiegh. in Bull. Soc. Bot. France, vol. xlii. p. 254 (1895). *L. speciosa*, Van Tiegh., l.c.

DISTRIB. Cape Colony: Divisions of Clanwilliam, Worcester, Prince Albert, Murraysburg, Graaff Reinet, Somerset, Queens-town, Cathcart, Komgha, Albany, Alexandria, Uitenhage.

#### THE SECTIONS OF LORANTHUS.

The erroneous identification of *Lichtensteinia oleaeifolia* with *Loranthus elegans* has led to the generic and serial names *Lichten-*



*steinia* and *Oleaefolii* being misapplied to the group of which *L. elegans* is the sole representative. For this group the sectional name *Moquinia* is now suggested.

The nomenclature of the subordinate groups within the genus *Loranthus* is in a rather confused state, owing to the very different divisions proposed by various authors.

In February, 1830, Martius segregated five genera from *Loranthus*: *Struthanthus*, *Psittacanthus*, *Tristerix*, *Dendrophthœ* and *Phthirusa*.\* Of these, the purely American genera *Struthanthus*, *Psittacanthus* and *Phthirusa* are still recognized, whilst *Dendrophthœ* has been re-united with *Loranthus*. *Tristerix* was based on *Loranthus viridiflorus*, Wall. (Nepal), *L. tetrandus*, Ruiz & Pav. (Chile) and *L. Reinwardtianus*, Schultes (Java), which are now referred respectively to the genera *Elytranthe*, *Phrygilanthus* and *Loxanthera*.†

In 1829 Blume prepared the *Loranthaceae* of his *Flora Javæ*,‡ and divided *Loranthus* into seventeen genera. He sent a synopsis of these to J. A. and J. H. Schultes, who published it in their *Systema Vegetabilium*, vol. vii. p. 1729 (1830). In the *Flora Javæ* itself, of which the part containing *Loranthaceae* did not appear until after February, 1830,§ Blume assigned only sectional rank to his segregates. Blume's seventeen genera or sections included *Lichtensteinia*, Wendl. (1810) and *Spirostylis*, Presl (1829), in addition to the five genera segregated by Martius. The new groups proposed by Blume were: *Dendropemon*, *Lipotactes*, *Phoenicanthemum*, *Loxanthera*, *Tapinanthus*, *Elytranthe*, *Macrosolen*, *Tolypanthus* and *Lepeostegeres*. He restricted *Tristerix*, Mart., to *L. tetrandus*, Ruiz & Pav., transferring to *Macrosolen* the two Asiatic species included by Martius.||

A. P. De Candolle proposed a very different classification of *Loranthus* in 1830. This was published in outline in his memoir on the *Loranthaceae*, and elaborated in the *Prodromus*. De Candolle corresponded with Blume about the *Loranthaceae* in 1829, and knew of Blume's unpublished genera, *Lepeostegeres*, *Elytranthe* and *Loxanthera*,¶ but was unacquainted with the remaining ones until after the completion of his work. He saw Martius's classification, however, in time to incorporate it in the Addenda to vol. iv. of the *Prodromus*. The following synopsis of De Candolle's classification indicates how Blume's groups correspond with De Candolle's.

Sect. I. EULORANTHUS, DC. Petals free; anthers basifixed or adnate.—*Loranthus*, *Dendropemon*, *Lipotactes*, *Phoenicanthemum*, *Dendrophthœ* (part), *Phthirusa*, *Struthanthus* (part).

Sect. II. SYMPHYANTHUS, DC. Petals united into a regular corolla; anthers basifixed.—*Dendrophthœ* (part), *Elytranthe*, *Macrosolen* (part), *Tolypanthus*, *Lepeostegeres*.

\* *Flora*, 1830, vol. i., p. 102.

† Gamble in *Journ. As. Soc. Beng.*, vol. lxxv., pp. 378, 369 (1914); Eichler in *Fl. Bras.*, vol. v., pars. 2, p. 47 (1868).

‡ *Mus. Bot. Lugd.-Bat.*, vol. i., p. 243.

§ On p. 10 he quotes *Bot. Zeit.*, 1830, No. 7; Pfeiffer is therefore incorrect in stating that Blume's *Fl. Jav. Loranth.* were published in 1829.

¶ *Fl. Jav. Loranth.*, p. 17.

|| DC. *Prodr.*, vol. iv., pp. 296, 298, 299, 316.

Sect. III. *SCURRULA*, DC. Petals united into a corolla which is split unilaterally; anthers basifixed.—*Dendrophthöc* (part), *Lichtensteinia*, *Tapinanthus*, *Macrosolen* (part).

Sect. IV. *NOTANTHERA*, DC. Petals nearly free, or united at the base into a regular corolla; anthers dorsifixed.

Subsect. 1. *OSCILLANTHERA*, DC. Anthers versatile.—*Psittacanthus*, *Tristerix*, *Spirostylis*, *Struthanthus* (part).

Subsect. 2. *LOXANTHERA*, DC. Anthers not versatile.—*Loxanthera*, Blume.

Endlicher adopted Blume's classification with little modification: he reduced *Lichtensteinia* to *Tapinanthus*, and divided *Dendrophthöc* into two subsections *Cichlanthus* and *Eudendrophthöe*.\*

In 1860 Grisebach founded the new section *Oryctanthus* on *Loranthus occidentalis*, Linn.† Two years later Oliver published a provisional arrangement of the species of *Loranthus* in 22 sections, but gave no names to those of his groups which were new.‡ Section 15 was based on *L. undulatus*, E. Mey., and *L. Acaciae*, Zucc., on which the sections *Plicopetalus* and *Tapinostemma* were respectively founded by Bentham. Section 18 included, in addition to some Asiatic species, two new African ones, *L. Mannii* and *L. Kirkii*, on which the sections *Sycophila* and *Acrostachys* were based by subsequent authors.

The Brazilian *Loranthaceae* were revised by Eichler in 1868.§ He proposed the new genus *Phrygilanthus*, which included *Tristerix* (as restricted by Blume) and part of *Struthanthus*. He raised *Loranthus* sect. *Oryctanthus*, Griseb. to generic rank, and established two subgenera of *Psittacanthus*, *Eupsittacanthus* and *Aëtanthus*, characterized respectively by versatile and non-versatile anthers.

Bentham recognized only two genera of the tribe *Loranthaceae*, *Nuytsia* and *Loranthus*, and divided the latter into 20 sections.¶ Four of these were new: *Acrostachys*, founded on *L. Kirkii*, Oliv.; *Plicopetalus*, founded on *L. undulatus*, E. Mey.; *Tapinostemma*, based on *L. Acaciae*, Zucc.; and *Heteranthus*, which included numerous species from the Malay Archipelago, Australia and New Zealand, and a single one, *L. Mannii*, from tropical Africa.

Bentham made the presence of a ventral tooth at the apex of the filament the criterion of the section *Tapinanthus*, in which he accordingly included *L. dodonaeifolius*, DC., and *L. Schimperii*, Hochst., in addition to *L. lanceolatus*, Beauv. (*L. Belvisii*, D.C.) and its allies.

In 1889 Engler followed Bentham in his treatment of the Old-world sections, accepting eleven of those defined by Bentham, but segregating the sections *Macrosolen*, *Elytranthe* and *Lepeostegeres* as a distinct genus, *Elytranthe*, Blume (sensu latiore).¶ He followed Eichler in regard to the American sections, recognizing

\* Endl. Gen. Plant., vol. ii., p. 801.

† Fl. Brit. W. Indies, p. 313.

‡ Journ. Linn. Soc., vol. vii., pp. 97-102.

§ Martius, Fl. Bras., vol. v., pars 2, pp. 1-135.

¶ Bentham & Hooker, Gen. Pl., vol. iii., p. 207 (1880).

¶ Engl. & Prantl, Nat. Pflanzenfam. vol. iii., 1, p. 183.



these as distinct genera; he raised *Psittacanthus*, subgenus *Aëtanthus*, Eichl., to generic rank, and revived the genus *Gaiadendron*, G. Don.; Eichler had included the latter in *Phrygilanthus*, whereas Bentham recognized *Phrygilanthus* and *Gaiadendron* as distinct sections of *Loranthus*.

In 1894 Engler revised the African species of *Loranthus*, and established a new section, *Ischnanthus*, distinguished from *Tapinanthus* by tetramerous flowers.\* He divided the section *Dendrophthoe* into 16 series, and *Tapinanthus* into four. *Dendrophthoe*, series *Oleaefolii*, was based on *Loranthus elegans*. Cham. & Schlecht., which, following Harvey, he erroneously identified with *L. oleaefolius*, Cham. & Schlecht. The African species on which *Tapinanthus*, Blume, was originally based, were included in *Tapinanthus*, series *Constrictiflori*. In 1895 Engler reduced the section *Tapinostemma* to *Plicopetalus*.†

Engler published a revised classification of Loranthaceae in 1897, adopting as sections or series of *Loranthus* many groups which Van Tieghem had published in the meantime as independent genera.‡ He restored generic rank to *Loranthera*, Blume, and recognized as valid Van Tieghem's genus *Peristethium*. He divided *Loranthus* into four subgenera, sixteen sections and fifty-three series. Two of the subgenera were composed of both sections and series, one included series only, and the fourth one sections only.

For the details of Engler's classification, Nachtrag i. of the Pflanzenfamilien must be consulted. The following synopsis of the African groups recognized by him may be found useful.

Subgenus I. EULORANTHUS, Engl. Petals free, without basal folds.

Sect. VII. SYCOPHILA, Engl. (only African section).

Subgenus II. DENDROPHTHOE, Engl. Petals united, without basal folds; filaments without a tooth.

This includes the African series: 4. *Laxiflori*, 5. *Ambigui*, 9. *Lichtensteinia*, 10. *Acranthemum*, 11. *Englerina*, 12. *Longiflori*, 14. *Involutiflori*, 15. *Rigidiflori*, 17. *Cinerascetes*, 18. *Lepidoti*, 19. *Cupulati*, 20. *Metula*, 21. *Rufescentes*, 22. *Infundibuliformes*, 23. *Inflati*, 25. *Hirsuti*, 27. *Longicalyculati*.

Subgenus III. TAPINANTHUS, Engl. Petals united, without basal folds; filaments with a tooth in front of the anther.

Sect. I. ISCHNANTHUS. Flowers tetramerous. Series 1. *Astephaniscus*, 2. *Stephaniscus*.

Sect. II. PENTATAPINANTHUS. Flowers pentamerous. Series 1. *Coriaccifolii*, 2. *Purpureiflori*, 3. *Obtectiflori*, 4. *Dentimetula*, 5. *Constrictiflori*.

Subgenus IV. PLICOTEPALUS, Engl. Petals free or united, provided with basal folds.

Sect. I. *Acrostachys*, II. *Euplicotepalus*, III. *Tapinostemma*.

During the period 1901-1909 the following new groups were described by Engler, the two last in collaboration with Krause:

\* Engl. Jahrb., vol. xx., pp. 81-130.

† Pflanzenwelt Ost.-Afr., vol. C. p. 167.

‡ Engl. & Prantl, Nat. Pflanzenfam. Nachtr., i., pp. 127-133.

*Tapinanthus*, series *Eubracteati*, founded on *Loranthus proteicola*, Engl. and *L. nigritanus*, Hook. f.;\* *Dendrophthoe*, series *Diplobracteati*, based on *Loranthus kwaiensis* Engl.;† *Euloranthus*, sect. *Lepidotepalum*, based on *L. periclymenoides*, Engl. & Krause;‡ *Tapinanthus*, series *Breviflori*, founded on *L. viminalis*, Engl. & Krause.§

When the writer described the *Loranthaceae* of tropical Africa in 1910, he rejected the division of *Loranthus* into subgenera, sections and series, as being unnecessarily complicated, and leading to the formation of artificial groups.|| For example, *Euloranthus*, sect. *Sycophila*, is unquestionably more closely allied to *Plicotepalus*, sect. *Acrostachys*, than the latter is to the two other sections of *Plicotepalus*. The subgenera *Dendrophthoe* and *Tapinanthus* appear to be artificial, individual groups assigned to the one subgenus having their closest allies in groups belonging to the other. Thus the *Rufescentes* appear to be allied to the *Eubracteati* and *Erectilobi*, whilst the *Infundibuliformes* seem to be related to the *Purpureiflori*. The only character by which *Tapinanthus* can be distinguished from *Dendrophthoe* is the presence of a tooth on the filament; this tooth is sometimes very minute (0.1–0.17 mm. in *L. Holstii*) and may be easily overlooked. Thus the genus *Englerina* (*Dendrophthoe*, series *Englerina*, Engl.) was founded by Van Tieghem on *Loranthus Holstii*, Engl., on the strength of the inaccurate statement that this species had no tooth.¶ Engler himself originally referred *L. Holstii* correctly to the section *Ischnanthus*, in spite of the tooth being, as he thought, missing. Similarly *L. irangensis*, Engl. (*Tapinanthus* series *Purpureiflori*) was re-described fourteen years later as a new species, assigned to *Dendrophthoe*, series *Infundibuliformes*, owing to the tooth on the filament being overlooked.\*\* The latter case illustrates the close resemblance which individual groups of the subgenus *Dendrophthoe* bear to others of the subgenus *Tapinanthus*, which suggests that the presence of a tooth on the filament has no greater taxonomic value than transverse septation of the anthers, or the presence of verticillately branched hairs.

The writer accordingly divided the tropical African species of *Loranthus* into 29 sections: twenty-four of these representing groups previously recognized by Engler, and five being new.†† He reduced the following groups: *Englerina*, *Metula*, *Inflati*, *Dentimetula* and *Breviflori*. *Loranthus viminalis*, Engl. & Krause, the type of the *Breviflori*, is in the writer's opinion a species allied to *L. Adolphi-Friderici* and *L. rupegensis*. The flowers appear to be galled; similar flowers occur, along with normally developed ones, in *L. Ehlersii* and *L. woodfordioides*, and have been found to contain larvae. Krause still maintains, however, that the flowers are normal, and has accordingly revived the series *Breviflori*.‡‡

\* Engl. Jahrb., vol. xxx., p. 303 (1901).

† ———, vol. xl., p. 522 (1908).

‡ ———, vol. xliii., p. 400 (1909).

§ ———, vol. xliii., p. 314 (1909).

|| Dyer, Fl. Trop. Afr., vol. vi., sect. 1, p. 256.

¶ Bull. Soc. Bot. France, vol. xlii., p. 257; Engl. Jahrb., vol. xx., p. 126.

\*\* Engl. Jahrb., vol. xx., p. 111; vol. xl., p. 527.

†† These are the *Tetrameri*, *Incrassati*, *Remoti*, *Rhamnifolii* and *Erectilobi*.

‡‡ Engl. & Prantl, Nat. Pflanzenfam. Nachtr., iv., p. 73.



The re-identification of *Lichtensteinia oleaeifolia*, Wendl., entails change in the nomenclature of the African sections. *Lichtensteinia*, Wendl., is a synonym of *Tapinanthus*, Blume, which corresponds to the series *Constrictiflori*, Engl. The sectional name *Moquinia* is now adopted for the group which has passed in recent years under the erroneous generic and serial names *Lichtensteinia* and *Oleaeifolia*.

The synonymy of the two sections is as follows:

Sect. *TAPINANTHUS*, Blume, Fl. Jav. Loranthe. p. 15; Endl. Gen. Pl. vol. ii. p. 802, excl. *Moquinia*; Benth. in Benth. & Hook. f. Gen. Pl. vol. iii. p. 210, excl. *L. dodonaeifolius* et *L. Schimperii*; Engl. in Engl. & Prantl, Nat. Pflanzenfam. vol. iii. i, p. 187, partim. Genus *Tapinanthus*, Blume apud Schult. Syst. Veg. vol. vii. p. 1730 (1830); Van Tiegh. in Bull. Soc. Bot. France, vol. xlii. p. 267, partim. Genus *Lichtensteinia*, Wendl. Coll. Pl. vol. ii. p. 4 (1810); Blume apud Schult. Syst. Veg. vol. vii. p. 1730. *Loranthus*, sect. *Lichtensteinia*, Blume, Fl. Jav. Loranthe. p. 14. *Loranthus*, subgen. *Tapinanthus*, sect. *Pentatapinanthus*, ser. *Constrictiflori*, Engl. in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. i. p. 133, partim. Sect. *Constrictiflori*, Sprague in Dyer Fl. Trop. Afr. vol. vi. sect. i, pp. 257, 268.

Type-species: *L. lanceolatus*, Beauv., *L. sessilifolius*, Beauv. The section comprises nearly 40 species including *L. oleaeifolius*, Cham. & Schlecht., the type of sect. *Lichtensteinia*. It seems inadvisable to employ the prior name *Lichtensteinia* for the above section, as this might lead to confusion.

Sect. *MOQUINIA*, Sprague. Genus *Moquinia*, A. Spreng. Tent. Suppl. Syst. Veg. p. 9 (1828). *Loranthus*, sect. *Dendrophthoe*, series *Oleaeifolia*, Engl. in Engl. Jahrb. vol. xx. p. 83. Genus *Lichtensteinia*, Van Tiegh. in Bull. Soc. Bot. France, vol. xlii. p. 254, non Wendl. *Loranthus*, subgen. *Dendrophthoe*, ser. *Lichtensteinia*, Engl. in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. i. p. 131.

Type and sole species: *L. elegans*, Cham. & Schlecht.

Engler and Krause have recently described the two new series *Longitubulosi* and *Botryoloranthus*, both included in the subgenus *Dendrophthoe*. *Botryoloranthus* seems from description to be a valid group allied to *Tetrameri*; whereas the series *Longitubulosi* is almost certainly identical with the genus *Septulina*, Van Tiegh., which Engler reduced to the *Cinerascentes*. *Septulina* differs, however, from the latter in having tetramerous flowers with erect corolla-lobes and filaments, and is accordingly retained by the writer as a section.

Sect. *SEPTULINA*, Sprague. Genus *Septulina*, Van Tiegh. in Bull. Soc. Bot. France, vol. xlii. p. 263 (1895). *Loranthus*, subgen. *Dendrophthoe*, series *Cinerascentes*. Engl. in Engl. & Prantl, Pflanzenfam. Nachtr. i. p. 131, partim. *Loranthus*, subgen. *Dendrophthoe*, series *Longitubulosi*, Engl. & Krause in Engl. Jahrb. vol. li. p. 455 (1914).

Type species: *Loranthus glaucus*, Thunb. (*L. longitubulosus*, Engl. & Krause, l.c., ex. descriptione), *L. ovalis*, E. Mey.

## LXVIII.—HEDYCHIMUM CORONARIUM AND ALLIED SPECIES.

W. B. TURRILL.

(With Plates.)

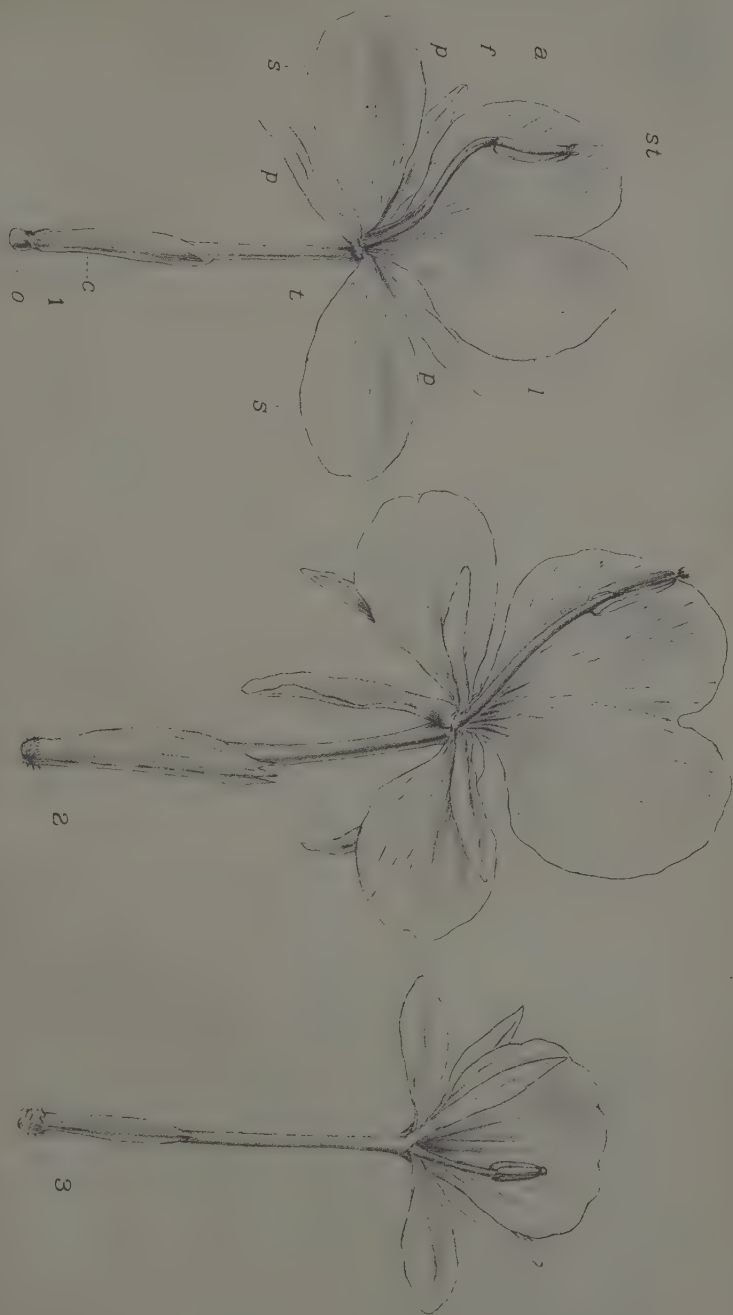
Recent investigations into the possibilities of using species of *Hedychium* as a source of material for paper-making\* have made it particularly desirable that a clear understanding of the exact botanical position of the plants experimented with should be obtained. The species dealt with in the present paper are all closely allied to one another, and the extreme difficulty experienced in dealing with dried specimens had resulted in great confusion of names and the sorting together of distinct forms. The latest monograph of *Hedychium* is that by K. Schumann in Engler's *Pflanzenreich*, 20. Heft (iv. 46), 1904, but it adds little to our knowledge of *H. coronarium* and its allies. Two older works dealing with the genus must be mentioned, the one, Roscoe's "Monandrian Plants of the Order Scitamineae," was published at Liverpool in 1828 and contains beautiful coloured plates of many species with corresponding descriptions in English, the other, Wallich's "Attempt to define the species of *Hedychium*," was published in the *Kew Journal of Botany*, V., p. 321, 1853, and contains Latin diagnoses of 23 species with full lists of synonyms.

It is proposed here to enumerate those species which have been considered by various authors to be varieties of *H. coronarium* and to give briefly the most important characters of each, but mention must first be made of *H. coronarium* itself. This most widely distributed and commonly cultivated species of *Hedychium* was described by Koenig in *Retz. Obs.* iii. p. 73, 1783, and has the following characters which distinguish it from other species of the genus: bracts large, coriaceous, closely imbricated, forming a more or less ovate strobilus and each protecting from four to six flowers which arise in succession; calyx tubular, split on one side, less than half the length of the corolla-tube, glabrous; corolla-tube 6-8 cm. long, cylindrical; corolla-segments 3, linear-lanceolate, equal, declined; lip large, broad, abruptly narrowed at the base, divided—but generally not deeply—into two elliptic-ovate lobes which are sometimes further lobed, pure white or slightly yellow in the lower part; lateral staminodes oblong- or ovate-elliptic, pure white or yellowish in the lower part; filament with the anther shorter than the lip, white or yellowish; the inferior ovary glabrous or slightly or densely hairy in the flowering stage. This plant is found wild or naturalized in most tropical countries. Good figures are to be found of it in: Roscoe, *Monandr. Pl.* t. 51; *Bot. Mag.*, t. 708; Smith, *Exotic Plants*, ii., t. 107.

The *H. maximum* of Roscoe, *Monandr. Pl.*, t. 52, is probably a variety of *H. coronarium*, distinguished by having broader leaves, distinctly ciliated bracts, large flowers, the lateral staminodes frequently with a lobe or tongue projecting from the centre, the filament tinged with pink, and the ovary and calyx densely pubes-

\* See *Kew Bulletin*, 1912, p. 373; 1914, pp. 165, 193.







cent. The writer has seen only one specimen of *H. maximum* and that a cultivated one. Its native country is unknown.

Two species which are closely related to *H. coronarium* and which in common with it have the filament and anther together shorter than the lip must now be considered. Both have yellow flowers which are smaller than those of *H. coronarium*. The first, *H. urophyllum*, Lodd., Bot. Cab., t. 1785, 1831, has frequently been reduced either to *H. coronarium* or to *H. flavum* or kept as a variety of one of these species, but in accordance with our present knowledge it seems best to consider it a distinct species specially characterised by having all the parts of the corolla and androecium deep yellow in colour, the lip entire or with only a slightly bilobed or undulating margin, and a stout filament which with the anther is distinctly shorter than the lip. The only flowering specimens of this plant at Kew are from Khasia, 900–1200 m. There is an excellent figure in the Botanical Magazine, t. 3039, under the name *H. flavum*, Roxb., from which plant, however, it is quite distinct, having larger flowers and a relatively shorter calyx.

The second species, *H. Elwesii*, is also known only from the Khasia Hills district, where it has been collected by H. J. Elwes and C. B. Clarke and figured by Sir J. D. Hooker. It was described by J. G. Baker in the Flora of British India, vi., p. 226, 1892, and has the following distinguishing features: flowers bright yellow; lip broad and distinctly two-lobed; filament slender, of a bright red colour.

*Hedychium flavescens*, Carey ex Roscoe, Pl. Monandr., t. 50, is a distinct species with the following important characters: flowers large, up to 14 cm. long, yellowish, the colour deeper in the basal portion; calyx nearly half as long as the corolla-tube; lip obovate-orbicular, bilobed, narrowed below to form a distinct claw; filament with the anther slightly longer than the lip. Apparently wild specimens of this plant are preserved at Kew from India and the Mascarenes, and it is often found in cultivation. Besides the accurate figure in Roscoe's work that in Wallich's Icones, t. 2008-9, may be mentioned.

*Hedychium chrysoleucum*, Hook., figured and described in Bot. Mag., t. 4516, is probably only a form of *H. flavescens*, with the base of the lip and lateral staminoides a deep orange-yellow. This form is also figured in Lindley and Paxton, Flower Garden, p. 110, t. 77.

We have now to deal with two plants concerning which there has been an unfortunate confusion. The name *Hedychium flavum* was first applied by Roxburgh in the Hortus Bengalensis. p. 1, 1814, to a plant called by the natives Kattea-tilook-seer, and said to have been collected in Silhet by Mr. M. R. Smith in 1810. There is at Kew one of Roxburgh's drawings, No. 2153, named *H. flavum*, R., and this, on the whole, agrees with the description published in Roxburgh's Flora Indica, 1., p. 81, 1820, which was edited by W. Carey with the assistance of Wallich, but here the native name is given as Kattia-rityam. In the manuscript editions of Roxburgh's Flora Indica at Kew and the British Museum Catteah-tilluk-see and Catteek-tilluk-seer are given as the vernacular names of *H. flavum*. Whatever Carey and Wallich



intended by *H. flavum* there seems no doubt that the plant intended by Roxburgh is quite different from that to which Roscoe, Pl. Monandr., t. 49, and most authors since his time have applied the name. The main distinguishing characters of *H. flavum*, Roxb., are: leaves with a long fine-acumen; spike oblong, with imbricate bracts which are oblong-ovate, subobtuse, about two and a half inches long and nearly one and a half broad; calyx nearly as long as the corolla-tube; lip obcordate, narrowed suddenly below into a very short claw, yellow with an orange patch in the centre and below; the filament with the anther about as long as or slightly shorter than the lip; ovary pubescent.



7. *H. flavum*.



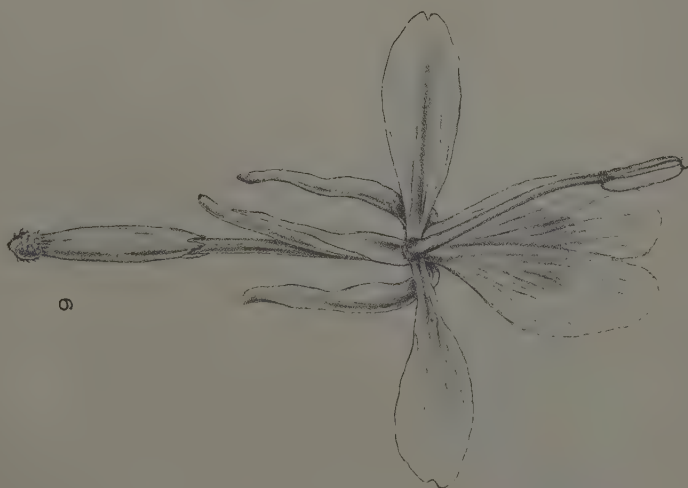
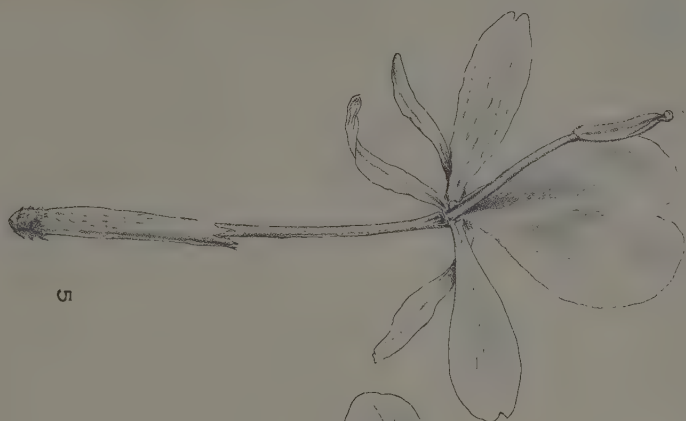
8. *H. subditum*.

For the *Hedychium flavum* of Roscoe, non Roxb., the name *H. subditum*, Turrill, is proposed. The plant is distinguished by having flowers 10-11 cm. long, a calyx about half as long as the corolla-tube, an ovate bilobed or obcordate lip which is narrowed into a distinct claw below, and by a filament which with the anther is distinctly longer than the lip. The plant named *H. flavum* in Lodd., Bot. Cab., t. 604 is probably this species.

The plants represented in Bot. Mag., t. 2378 and Lodd., Bot. Cab., t. 723 are very similar, and both are probably hybrids between *H. spicatum*, J. E. Sm., and *H. subditum*, Turrill.

In order to facilitate the identification of specimens the following key to the species dealt with above has been prepared:

M. Smith. del







Flowers pure white or with only a tinge of yellow.

Lip about  $4.75 \times 4$  cm.

*H. coronarium*, Koenig.

Lip  $6.75 \times 4.5$  cm.

*H. maximum*, Roscoe.

Flowers yellow to orange.

Lip entire, slightly bilobed or with a wavy margin; filament stout, yellow.

*H. urophyllum*, Lodd.

Lip distinctly bilobed.

Filament slender, of a bright red colour; lip broad.

*H. Elwesii*, Baker.

Filament yellow.

Flowers 13 to 14 cm. long.

Lip and lateral staminodes yellow.

*H. flavescens*, Roscoe.

Lip and lateral staminodes deep or orange-yellow towards the base.

*H. chrysoleucum*, Hook.

Flowers 8 to 11 cm. long.

Calyx nearly as long as the corolla-tube; filament with the anther as long as or slightly shorter than the lip.

*H. flavum*, Roxb.

Calyx about half as long as the corolla-tube; filament with the anther distinctly longer than the lip.

*H. subditum*, Turrill.

It has already been stated that much of the confusion which is found in the systematic works dealing with *Hedychium* is due to the difficulty of working satisfactorily with dried material. The large majority of the specimens preserved in the Kew and British Museum Herbaria are leafy inflorescences which were dried entire with the flowers still on, and no attempt was made to preserve the shape of the floral parts. Consequently, it is often impossible to make out such important characters as the shape of the lateral staminodes and labellum and the relative length of the filament. Moreover, the usual method of preparing dried flowers for dissection by boiling in water is not satisfactory here, for with such treatment they generally form a soft pulpy mass from which their original structure cannot be determined. However, if the following hints are carefully followed the preparation of adequate herbarium specimens is a comparatively simple matter. A specimen should be selected which is in full flower and a complete stem taken and cut up into suitable lengths of about 15 inches. Each length should be numbered, so that on examination of the dried material the sequence of the specimens is obvious. The leafy portions can be dried in the ordinary manner, the leaves when larger than the sheet of drying paper being carefully bent over. A few leaves with complete ligules should be dried separately. The inflorescence is best taken with two or three leaves still attached just below it, and sliced down the centre, each half being dried alone. The chief care, however, should be given to the drying of individual flowers. Buds, young, mature and old flowers should be taken from the axils of the bracts and laid separately between sheets of blotting or other absorbent paper. It is essential that each flower so dried should be complete, and care is needed to ensure that the small inferior ovary is detached from the inflorescence with each flower taken. The various floral parts, perianth

segments, lateral staminodes and labellum should be spread out flat, and, as far as possible, should not overlap one another. Under moderate pressure the flowers soon dry, and the paper actually containing the flowers should not be changed until drying is complete.

As it seems likely that species of *Hedychium* may attain considerable economic importance in the future, it is to be hoped that correspondents desiring names for plants of this genus will forward specimens which have been dried according to the instructions here given.

#### EXPLANATION OF PLATES AND FIGURES IN TEXT.

The figures represent the flowers, all three-quarters natural size, of the species dealt with above. The various floral parts in the figure of *H. coronarium*, Koenig, have been given distinguishing letters, a key to which is given below. As the figures of all the flowers are drawn approximately with the same orientation, it will be easy to determine the different organs by comparison with this one figure and the key.

Figure 1. *Hedychium coronarium*, Koenig. o. ovary. c. calyx. t. corolla-tube. p.p.p. corolla segments. l. labellum or lip. ss. lateral staminodes. f. filament. a. anther. st. stigma.

Figure 2. *H. maximum*, Roscoe. From the type specimen in Herb. Kew., showing additional lobes on the lateral staminodes.

Figure 3. *H. urophyllum*, Lodd. From a specimen in Herb. Kew., collected by Hooker in the Khasia Hills.

Figure 4. *H. Elwesii*, Baker. From a specimen in Herb. Kew., collected by C. B. Clarke in the Khasia Hills.

Figure 5. *H. flavescens*, Roscoe. From a specimen cultivated in Ceylon.

Figure 6. *H. chrysroleucum*, Hook. Adapted from the figure of the type in Bot. Mag. t. 4516.

Figure 7 (text-figure). *H. flavum*, Roxb. From the drawing of the type plant in Herb. Kew.

Figure 8 (text-figure). *H. subditum*, Turrill. From a cultivated specimen preserved in Herb. Kew.

### LXIX.—NEW ORCHIDS. DECADE 43.

421. *Cirrhopetalum formosanum*, Rolfe; a *C. elato*, Hook. f., foliis latioribus, seapis duplo brevioribus, et saepissime bifloris, et sepalis lateralibus longioribus differt.

*Pseudobulbi* approximati, ovoidei, vaginis ovatis acuminatis venosis vestiti, monophylli, 1-1.5 cm. longi. *Folia* breviter petiolata, elliptico-oblonga, acuta, coriacea, 7-10 cm. longa, 2.5-4 cm. lata; petioli 0.5-1 cm. longi. *Scapi* graciles, circiter 9 cm. longi. vaginis lanceolatis paucis obtecti, pauciflori. *Bracteae* oblongo-lanceolatae, acutae, subconcavae, 4 mm. longae. *Pedicelli* subrecti, 1 cm. longi. *Flores* mediocres, umbellati. *Sepalum* posticum oblongo-lanceolatum, acutum, concavum, eciliatum, 1.2

cm. longum; sepala lateralalia linearia, acuta, subconcaeva, medio cohaerentia, glabra, 2·5 cm. longa. *Petala* falcato-oblonga, subobtusata, eciliata, 5 mm. longa. *Labellum* recurvum, carnosum, oblongum, obtusum, 4 mm. longum. *Columna* oblonga, 2 mm. longa, basi subauriculata; dentes lineari-spathulati, 1·5 mm. longi.

FORMOSA. *W. R. Price.*

A Formosan species which was sent to Kew by Mr. W. R. Price two years ago and has flowered on two or three occasions. The flowers are straw-yellow, with a deep yellow lip and a suffusion of pink in the petals.

422. *Ione flavescens*, *Rolfe*; affinis *I. Andersoni*, King et Pantl., sed scapis bifloris et partibus omnibus majoribus differt.

*Rhizoma* repens. *Pseudobulbi* subdistantes, depresso-ovoidei, 1 cm. longi, 1·4 cm. lati, monophylli. *Folia* lineari-oblonga, subobtusata, circiter 5·5 cm. longa, 1 cm. lata. *Pedunculi* laterales, breves, circiter 2 cm. alti, vaginis ovato-oblongis imbricatis obtecti, biflori. *Flores* mediocres. *Sepala* reflexa, ovato-oblonga, subacuta, 0·8–1 cm. longa, marginibus revolutis. *Petala* subpatentia, lineari-oblonga, subobtusata, 8 mm. longa, basi latiora et ciliata. *Labellum* erectum, 6–7 mm. longum, subcarnosum, basi suborbiculare, denticulatum, concavum, transverse incrassatum, apice lineari-oblongum, angustum et subobtusum. *Columna* lata, 2 mm. longa. *Pollinia* 4, per paria stipitibus 2 distinctis affixa, glandula squamiformi duplici.

BURMA. Mount Victoria, *Mrs. Wheeler Cuffe.*

Flowered in the Royal Botanic Garden, Glasnevin, in September, 1914, when it was sent to Kew for determination by Sir Frederick W. Moore. It was allied to *Ione Andersoni*, King & Pantl., and like it has the pollinia attached in pairs to two clavata stipes situated on either side of the broad column, and each with a distinct squamiform gland. The sepals are pale yellowish-green, and the petals and lip deep yellow.

423. *Coelogyne siamensis*, *Rolfe*; affinis *C. lentiginosae*, Lindl., sed floribus majoribus et labelli carinis verrucosis differt.

*Pseudobulbi* ovoidei vel ellipsoideo-ovoidei, 2·5–4 cm. longi, basi vaginis ovatis membranaceis obtecti, apice diphylli. *Folia* breviter petiolata, elliptica vel elliptico-oblonga, acuta vel breviter acuminata, subundulata, plicata, 13–15 cm. longa, 4–5 cm. lata; petiolus 1·5 cm. longus. *Scapus* inter pseudobulbum rudimentum et bracteam imbricatum emissus, erectus, circiter 10 cm. altus, pauciflorus. *Bracteae* elliptico-oblongae, subobtusae, valde concavae, 1·5–2 cm. longae. *Pedicelli* 1·5 cm. longi. *Flores* magni. *Sepalum* posticum erectum, late elliptico-oblongum subacutum, concavum, 3·5 cm. longum, 1·7 cm. latum; sepala lateralalia subpatentia, lanceolato-oblonga, acuta, carinata, 3 cm. longa, 1 cm. lata. *Petala* patentia, lanceolato-linearialia, 3·2 cm. longa. *Labellum* erectum, trilobum, 2·5 cm. longum; lobi laterales erecti, oblongi, obtusi, 1·2 cm. longi; lobus intermedius obovato-orbicularis, subacutus, 1·5 cm. latus; discus tricarinatus, verrucosus, carina intermedia brevi et basi lata. *Columna* clavata, 2 cm. longa.

SIAM. Bangkok, *C. Roebelen.*



Flowered at Kew in October, 1914. The plant has much of the general appearance of *C. lentiginosa*, Lindl., except that the bulbs are much more ovoid, and the flowers larger and at present only two in number; but the crest of the lip is very different, the keels being broken up into a number of wart-like papillae, and the middle one short and broad at the base. The sepals and petals are pale green, and the lip light yellow, with a broad dark brown margin to the side lobes, some brown streaks and dots on the disc, and some bright yellow at the apex of the lateral keels and the base of the central one.

424. *Arundina subsessilis*, Rolfe; species distincta, floribus ad apices ramorum subsessilibus facile distinguenda.

*Caules* erecti, circiter 25 cm. alti, foliosi. *Folia* sessilia, disticha, recurva, lanceolata, acuminata, 10–14 cm. longa, 1.5–1.8 cm. lata, basi subamplexicaulia. *Flores* terminales, pauci, mediocres, subsessiles. *Bracteae* oblongo-lanceolatae, acuminatae, 1–2 cm. longae. *Sepala* subpatentia, lanceolato-oblonga, subacuta vel apiculata, circiter 1.3 cm. longa. *Petala* elliptico-oblonga, subobtusata, 1.1 cm. longa. *Labellum* subintegrum, late ellipticum, obtusum, crispo-undulatum, 1.1 cm. longum; discus 5-lamellatus. *Columna* clavata, 1 cm. longa.

UPPER BURMA.

Introduced by Messrs. Sander and Sons, and flowered in the collection of Mr. H. J. Elwes, Colesborne, Gloucestershire, in September, 1914. It is said to be completely herbaceous. The flowers are nearly white, with lilac-purple tips to the sepals and petals, a violet-purple zone round the limb of the lip just inside the margin, and the keels yellow.

425. *Eulophia subintegra*, Rolfe; in Dyer Fl. Cap. vol. v. sect. iii. p. 41, anglice; habitu *E. Rehmanni*, Rolfe, sed petalis angustioribus et labello subintegro valde differt.

*Folia* elongato-lanceolata, acuta vel acuminata, plicata, 22–30 cm. longa, 3–5 cm. lata (basin non vidi). *Scapi* graciles, 25 cm. alti, vaginis paucis obtecti (basin non vidi); racemi laxi, 10 cm. longi. *Bracteae* lineari-lanceolatae, acuminatae, 1.2–1.8 cm. longae. *Pedicelli* 1.2 cm. longi. *Flores* majusculi. *Sepala* lineari-lanceolata, acuminata, 1.8 cm. longa, brunnea. *Petala* oblonga vel elliptico-oblonga, subacuta, 1.8 cm. longa, sepalis plus duplo latiora, flava. *Labellum* integrum vel subintegrum, ellipticum, subobtusum, petalis brevius et latius; discus leviter puberulus, 7–9 carinatus, supra in venos numerosos extensus; calcar elevatum, 5 mm. longum.

SOUTH AFRICA. Natal: damp places at Oliviers Hook; sources of the Tugela River, 1530 m., Allison 8.

426. *Eulophia Sankeyi*, Rolfe; in Dyer Fl. Cap. vol. v. sect. iii. p. 46, anglice; ab *E. fragrante*, Schlechter, petalis latioribus, labello subtrilobo differt.

*Rhizoma* non vidi. *Folia* 3–4, fasciculata, oblongo-linearata, acuta, 10–15 cm. longa, paullo recurva, venis primariis 5, basi squamis paucis obtectata. *Scapi* 22 cm. longi, validi, vaginis

plurimis late oblongo-lanceolatis imbricatis obtecti; racemi circiter 10 cm. longi, laxiusculi, 10–12-flori. *Bracteae* ovato-lanceolatae vel elliptico-lanceolatae, breviter acuminatae, 1.2–1.8 cm. longae. *Pedicelli* circiter 1.8 cm. longi. *Flores* majusculi, ochroleuci. *Sepala* ovato-lanceolata, acuta, 1.8–2.5 cm. longa, postico lateralibus paullo latius. *Petala* ovata, acuta vel breviter et abrupte acuminata, sepalis duplo latiora. *Labellum* ovatum, breviter trilobum, petalis paullo minori; lobi laterales breves, apice rotundati; lobus intermedius late ovatus, apiculatus vel subacutus, subundulatus; discus medio ad basin 5–7-carinatus, carinis incrassatis verrucosis; calcar oblongum, subobtusum, 3 mm. longum. *Columna* clavata, 6 mm. longa, basi in pedem brevem producta; anthera minute apiculata.

SOUTH AFRICA. Orange River Colony; Harrismith, *Sankey* 306.

427. *Eulophia inandensis*, *Rolfe*; in *Dyer Fl. Cap.* vol. v. sect. iii. p. 47, anglice; ab *E. bilamellata*, Schlechter, labello latiore et subintegro differt.

*Rhizoma* et *folia* non vidi. *Scapi* circiter 30 cm. longi, basi vaginis brevibus oblongo-lanceolatis obtecti; racemi 7.5 cm. longi, 7–8-flori. *Bracteae* lanceolatae, acuminatae, 4–6 mm. longae. *Pedicelli* circiter 7 mm. longi. *Flores* mediocres, flavi et brunnei. *Sepala* elliptico-oblonga, apiculata, circiter 7 mm. longa. *Petala* elliptica, subobtusa, sepalis brevioribus et multo latioribus. *Labellum* ovatum, obtusum, subintegrum, petalis aequale; discus carinis incrassatis et paullo verrucosis instructus; calcar conicum, obtusum, circiter 6 mm. longum. *Columna* clavata, circiter 6 mm. longa; anthera obtusa.

SOUTH AFRICA. Natal; Inanda, *Wood* 976.

428. *Eulophia Peglerae*, *Rolfe*; in *Dyer Fl. Cap.* vol. v. sect. iii. p. 49, anglice; affinis *E. inaequali*, Schlechter, sed labelli calcare multo brevioris et lobis lateralibus amplioribus differt.

*Rhizoma* et *folia* non vidi. *Scapus* (basin non vidi) vaginis lanceolatis paucis obtecti; racemi breves, circiter 6-flori. *Bracteae* oblongo-lanceolatae, acuminatae, circiter 1.2 cm. longae. *Pedicelli* bracteis paullo longiores. *Flores* mediocres. *Sepala* oblongo-lanceolata, acuta, 1.2–1.4 cm. longa. *Petala* oblongo-lanceolata, subacuta, sepalis paullo breviora. *Labellum* profunde trilobum, circiter 1.2 cm. longum; lobi laterales oblongi, obtusi, subdivergentes, lobo intermedio fere acquilongo; lobus intermedius obovatus vel late obovato-oblongus, obtusus, 6 mm. longus; discus puberulus, carinatus, carina medio leviter verrucosa basi tenui; calcar latum, obtusum, brevissimum. *Columna* clavata, circiter 7 mm. longa, basi in pedem brevissimum extensa.

SOUTH AFRICA. Transkei; Kentani, *Miss Pegler in Herb. Bolus* 10,677.

429. *Polystachya Hislopiae*, *Rolfe*; affinis *P. Lawrenceanae*, Kränzl., sed labelli lobo intermedio angustiore et valde recurvo, et disco callo lato et regulariter papilloso differt.

*Herba* epiphytica. *Pseudobulbi* caespitosi, ovoideo-oblongi vel fusiformi-oblongi, 3–5 cm. longi, 0.8–1.2 cm. lati, prope apicem

3-4-phylli, infra vaginis striatis purpureo-tinctis obtecti. *Folia* lanceolato-oblonga, subobtusa, 6-12 cm. longa, 0.8-1.5 cm. lata. *Pedunculi* terminales, circiter 12 cm. longi, subcompressi, villosuli, pauciflori, medio vagina subulata obsecta. *Bractaeae* ovatae, breviter acuminatae, villosulae, 4-5 mm. longae, basi concavae. *Pedicelli* villosuli, 0.8-1 cm. longi. *Sepala* subpatentia, ovato-oblonga, subobtusa, subincurva, concava, extus villosula, posticum 1 cm. longum, 6 mm. latum, lateralia 1.2 cm. longa, 7 mm. lata. *Petala* incurva, obovato-lanceolata, subobtusa, 8 mm. longa, 3 mm. lata. *Labellum* trilobum, 8 mm. longum; lobi laterales suberecti, rotundati, obtusi, 4 mm. lati; lobus intermedius ovatus, acutus, valde recurvus, 5 mm. longus; discus callo lato regulariter papilloso instructus. *Columna* lata, 2 mm. longa, pede 5 mm. longo.

TROPICAL AFRICA. Rhodesia, A. Hislop.

Sent to Kew by Mr. Alexander Hislop, Makoni Kop, Rusapi, S. Rhodesia, and flowered in the collection in September, 1914. The sepals and petals are light emerald green, and the lip white, with a rose-coloured margin, a few similar radiating veins on the side lobes, and a few pale purple spots at the base of the front lobe. Except in the details of the lip there is a considerable resemblance to *P. Lawrenceana*, Kränzl., from the Upper Zambesi.

430. *Zygopetalum Prainianum*, Rolfe; affinis *Z. Burkei*, Reichb. f., sed pseudobulbis longioribus, foliis latioribus, et colore florum differt.

*Herba* terrestris. *Pseudobulbi* oblongi, basi paullo incrassati, sulcati, 3-10 cm. longi, apice 2-3 phylli. *Folia* ligulata vel elongato-oblonga, subobtusa, subarcuata, 20-35 cm. longa, 1.5-3 cm. lata, subcoriacea. *Scapi* erecti, circiter 60 cm. longi, basi vaginis spathaceis obtecti, 4-5 flori. *Bractaeae* ovato-oblongae, subacutae, conduplicato-concavae, 1.5-2 cm. longae. *Pedicelli* 3-4 cm. longi. *Flores* speciosi. *Sepala* et petala patentia vel subreflexa, lanceolato-oblonga, subacuta, subcarnosa, circiter 2.5 cm. longa, 1 cm. lata. *Labellum* subpatens, pandurato-oblongum, subacutum, 2 cm. longum, 1.5 cm. latum, prope apicem subincurvum et crenulatum, basi callo crasso 11-jugo et dentato instructum. *Columna* clavata, incurva 1.5 cm. longa; alae triangulari-oblongae, 4 mm. longae.

PERU. *L. Forget*.

Imported by Messrs. Sander and Sons through their collector L. Forget, and flowered at St. Albans in September, 1914, afterwards passing into the Kew collection. The sepals and petals are dusky brown, with obscure green stripes on the petals, and the lip white with light rose-purple streaks on the fleshy ribs of the callus.



## LXX.—DECADES KEWENSES

PLANTARUM NOVARUM IN HERBARIO HORTI REGII CONSERVATARUM.

## DECAS LXXXIII.

821. *Capparis fusifera*, *Dunn* [Capparidaceae-Cappareae]; *C. brevispinæ*, *Wight et Arn.*, affinis, fructu fusiformi foliisque 8-12 cm. longis distincta.

*Frutex* scandens; rami primo tomentelli, mox glabri, spinis paucis parvis validis uncinatis armati. *Folia* lanceolata, acuminato-caudata, basi obtusa, 8-12 cm. longa, utrinque glabra, reticulata; venae erecto-patentes, utrinque 8-10, intra marginem arcuatim connexae; petioli 7-9 mm. longi. *Flores* axillares, 1-3-ni; pedunculi 1.4-1.6 cm. longi. *Fructus* fusiformis, gynophoro 1.5 cm. longo excluso 4-5 cm. longus, 1.5-2 cm. latus, deorsum sensim sed ad apicem subito acuminatus, rugosus, 3-locularis. *Semina* 1-3, superiore nonnunquam solum evoluto, 1.7 × 1.2 × 0.7 cm., castanea.

INDIA. Madras Presidency: Tinnevely District; Udumanparai, *Barber* 5726.

822. *Alsodeia grandiflora*, *Ridley* [Violaceae-Alsodeieae]; frutex *A. floribundae*, *King*, affinis, foliis longis subsessilibus, floribus multo majoribus, in genere maximis, petalis angustis linearibus lanceolatis distinctus.

*Frutex* 8-pedalis, glaber. *Folia* elliptico-lanceolata, acuminata, basi rotundata, 19-24 cm. longa, 5.5-9.5 cm. lata, membranacea, sicca grisea, nervis ascendentibus 10-paribus, nervulis transversis subtus elevatis, petiolo brevissimo ad 1 mm. longo. *Cymae* axillares vel extra-axillares, 4-7 cm. longae, pedunculo 2 cm. longo, ramis dichotomis, floribus pluribus albis. *Sepala* lanceolata, subacuta, in margine ciliata, dorso sericea, 3 mm. longa. *Petala* lineari-lanceolata, obtusa, 9 mm. longa, costa sericea. *Stamina* longa, filamentis antheras aequantibus hirtis, antheris angustis lanceolatis acutis, appendice terminali lanceolata. *Ovarium* villosum. *Stylus* cylindricus, villosus. *Discus* subprofundus, glaber, 5-lobatus.

MALAY PENINSULA. Singapore; in a wood at Anghio Kio, *Ridley* 6383; Johor, Ulu Batu Pahat, *Lake and Kelsall* 4042.

This has larger flowers than any species I know of in Asia, though there are some species in Africa, as, for instance, *A. elliptica*, *Oliver*, which have flowers nearly or quite as large.

823. *Alsodeia hirtella*, *Ridley* [Violaceae-Alsodeieae]; arbuscula, *A. Kunstlerianae*, *King*, affinis, sed foliis subtus, ramis floribusque rigide hirtis, sepalis latoribus suborbicularibus hirtis, petalis brevioribus truncatis et filamentis longioribus distincta.

*Arbor* parva, ramis hirtis. *Folia* lanceolata, longe acuminata, obtusa, basi inaequilateralia, angusta, obtusa, in margine serrulata vel integra, 14-24 cm. longa, 5-7 cm. lata, nervis 16-paribus cum costa et nervulis hirtis, petiolo 1.8-2 cm. longo. *Racemi* breves, axillares, 6-flori. *Bractaeae* lanceolatae, acutae. *Flores* albi. *Sepala* exteriora 3, orbicularia, imbricata, extus

hirta, sicca venosa, interiora 2, glabra. *Petala* paullo longiora, imbricata, glabra, oblonga, obtusa, truncata, apice processubus paucis ornata. *Stamina* glabra, filamentis complanatis antheris aequilongis, antherarum loculis processubus 2 elongatis terminatis, appendice dorsali latiore ovata. *Ovarium* conicum, hirtum. *Stylus* cylindricus. *Capsula* pallide viridis, 1 cm. longa, valvis ovatis subacutis parce strigosis.

MALAYA. Penang: Waterfall, Curtis 1898. Borneo: Sarawak, Beccari 2878; Mt. Buau, on limestone, Haviland 1997; Mt. Koum, Haviland 1715.

This has very much the appearance and habit of *A. Kunstleriana*, King, but is hairy and has curiously truncate petals with short processes at the tip.

824. *Pultenaea pauciflora*, Scott [Leguminosae-Podalyrieae]; affinis *P. viscosae*, R.Br., sed foliis mucronatis et floribus 1-2 tantum conspicue differt.

*Frutex* copiose et divaricate saepius pseudo-verticillatim ramosus, ramis primo cinereis mox castaneis, junioribus cano-villosis. *Folia* simplicia, lineari-lanceolata, falcata vel ensiformia, basi attenuata, pulvino deflexo, apice mucronata mucrone 1.5-2 mm. longo demum deciduo, 1.5-1.7 cm. longa, 1.7 mm. lata, integra, plana vel margine paulo incrassato levissime recurvata, costa conspicua, viridia, glabra vel leviter tomentosa, juniora cinereo-viridia, pilis patentibus albis 2 mm. longis induta, ad ramorum apices conferta, subsessilia; stipulae lineares, 3-5 mm. longae, fuscae, cum foliis deciduae. *Flores* magui, sicco flavi, terminales, pauci (1-2), inter folia conferta sessiles; bracteola a calyce libera, rubro-fusca, 3-5 mm. longa. *Calyx* pilis albis dense indutus, 6 mm. longus, regulariter 5-fidus, lobis tubum aequantibus. *Vexillum* magnum, obcordatum, 1 cm. diametro, ungue 2.5 mm. longo; alae 1 cm. longae, 3.5 mm. latae auricula 1 mm. longa; carina 1.1 cm. longa, 4.5 mm. lata. *Stamina* basi libera, 0.9-1 cm. longa; filamenta filiformia, basi plus minusve dilatata; antherae versatiles, oblongae, 1 mm. longae. *Ovarium* sessile, dense albo-pilosum; stylus filiformis, 8 mm. longus, stigmatibus minutis glabro. *Legumen* ovoideum, 9 mm. longum, 4.5 mm. latum, pilis longis albis indutum.

WESTERN AUSTRALIA. Narrogin Experiment Farm, Stoward 64.

825. *Crotalaria (Eucrotalaria) shanica*, Lace [Leguminosae-Genisteae]; a *C. striata*, DC., racemo gracili, floribus insigniter distantibus recedit.

*Herba* sarmentosa, caulibus gracilibus simplicibus vel ramosis mox parum sulcatis fere glabris. *Folia* trifoliolata, petiolo 2.5-5 cm. longo supra canaliculato tenuiter puberulo suffulta; stipulae deciduae, minutae, lanceolatae; foliola obovata, apice acuminata, acuta, mucronulata, basi cuneata, terminali lateralibus parum majore, usque ad 5.5 cm. longa et 3.2 cm. lata, membranacea, supra glabra, infra pilis albis adpressis hic illic instructa, nervis inter se distantibus utrinque conspicuis, integra, petiolulis usque ad 2 mm. longis brunneo-pubescentibus suffulta. *Racemi* foliis oppositi, simplices, laxiflori, 12-20 cm. longi, pedunculo

communi usque ad 3 cm. longo suffulti; pedicelli graciles, 5-6 mm. longi, bracteolis duabus minutis circiter medium instructi; bracteae angustae, usque ad 3.5 mm. longae. *Calycis* lobi inter se subaequales, oblongo-lanceolati, acuti, 6 mm. longi, 2 mm. lati, parum puberuli. *Corolla* lutea; vexillum orbiculare, circiter 1 cm. diametro, glabrum, venis notatum, ungui brevi breviter densius piloso; alae oblongae, circiter 8 mm. longae et 4 mm. latae, ungui circiter 1.5 mm. longo; carina 8 mm. longa, 5 mm. lata, ungui 1 mm. longo. *Stamina* generis, filamentorum tubo circiter 2.5 mm. longo. *Ovarium* sessile, glabrum, multi-ovulatum; stylus 8 mm. longus, superne longitudinaliter barbatus. *Legumen* (vix maturum) oblongum, apice rotundatum, 2 cm. longum, 6 mm. diametro, glabrum, calyce styloque persistentibus.

INDO-CHINA. Upper Burma: Gokteik, 700 m., *Lace* 5447.

826. *Sempervivum ciliosum*, *Craib* [Crassulaceae]; ab affini *S. Braunii*, Funck ex Koch, rosulis multo densioribus apice fere planis, foliorum pilis conspicue longioribus facile distinguendum.

*Rosulae* steriles apice magis minusve planae, usque ad 3 cm. diametro; folia conferta, oblongo-oblancoolata, plus minusve acuminata, obtusiuscula, usque ad 1.7 cm. longa et 4 mm. lata, dorso superne carinata, apicem versus pilis longis albis conspicue ciliata dorsoque superne pilis similibus instructa, intra brevius pubescentia, exteriora apice rubro-suffusa, interiora omnino viridia. *Caulis* floriferus circiter 5 cm. altus, undique pilis glanduloso-capitatis instructus, foliis imbricatis apice rubro-suffusus ornatus, flores circa 6 subsessiles gerens; bracteae parvae, angustae. *Calycis* lobi oblongo-lanceolati, acuti, 3 mm. longi, 1.5 mm. lati, satis carnosi, dorso glanduloso-pubescentes. *Corolla* 2.3 cm. diametro; petala 9-11, linearia, 8.5 mm. longa, 1.75 mm. lata, pallide viridia, dorso margineque glanduloso-pubescentia. *Stamina* circiter 5 mm. longa, filamentis pallidis inferne breviter glanduloso-pubescentibus, antheris luteis. *Squamae* hypogynae, parvae, pallidae. *Carpella* staminibus subaequalia, breviter parcius glanduloso-pubescentia, stylis erectis.

Described from a plant which flowered at Kew in the middle of October of the present year. A flowering specimen was also received from Cambridge Botanic Gardens in October, 1913.

827. *Ilex Englishii*, *Lace* [Ilicaceae]; ab *I. macrophylla*, Wall., foliis vix acuminatis nervisque lateralibus paucioribus et ab *I. cochinchinensi*, Lour., nervis lateralibus supra haud omnino obscuris, foliis infra haud reticulatis distinguenda.

*Frutex* grandis vel arbuscula, sempervirens, ramulis magis minusve angulatis primo minute puberulis mox glabris cortice cinereo-albo obtectis. *Folia* oblonga, elliptico-oblonga vel oblanceolata-oblonga, apice acuta vel interdum rotundata, basi cuneata vel late cuneata, 5-11 cm. longa, 2-4.5 cm. lata, coriacea, glabra, supra nitida, infra pallidiora, costa supra impressa infra valde prominente, nervis lateralibus utrinque 10-14 haud obscuris mox pagina superiore leviter impressis inferiore prominentibus, margine integro parum recurvo; petioli 0.5-1.5 cm. longi, supra canaliculati, primo minute puberuli, demum glabri; stipulae

minutae, puberulae. *Inflorescentiae* masculae axillares, e cymis umbelliformibus solitariis vel racemosim dispositis constitutae, pedunculo communi usque ad 1.3 cm. longo simul ac ramulis juvenilibus pedicellis bracteisque puberulo suffultae; pedicelli ad 3 mm. longi; bractee bracteolaeque minutae. *Calyx* circiter 3 mm. diametro, dorso puberulus; lobi 5-6, acuti, tubo subaequilong, ciliolati. *Corolla* glabra, circiter 5 mm. diametro, lobis basi breviter connatis. *Filamenta* 1.5 mm. longa. *Inflorescentiae* femineae masculis similes nisi breviores et e floribus paucioribus constitutae. *Calyx corollaeque* maris. *Stigma* globosum, sessile. *Fructus* (an maturus?) depresso-globosus, 3-4 mm. diametro, fuscus, stigmatate calyceque persistentibus.

INDO-CHINA. Upper Burma: Maymyo Plateau, 1050 m., *Lace* 6164 (type), 5283, *English* 30.

To this species should probably also be referred *Lace* 6155, collected in the same place, which differs in its larger leaves and rather larger flowers.

828. *Ipomoea maymyensis*, *Lace* [Convolvulaceae—Convolvuleae]; ab *I. popahense*, Coll. et Hemsl., foliis brevioribus multo latoribus et ab *I. siamense*, Craib, foliis basi haud cordatis inter alia facile distinguenda.

*Herba* volubilis; caules graciles, setosi. *Folia* ovato-lanceolata lateve lanceolata, apice acuta, basi rotundata vel rarius rotundato-cuneata, 7-11.5 cm. longa, 2.5-4.3 cm. lata, chartaceo-membranacea, utrinque pilis longiusculis subrigidis albidis adpressis basi tuberculatis instructa, infra pallidiora, nervis lateralibus utrinque 6-8 pagina utraque conspicuis, nervulis infra subconspicuis, integra, ciliata; petioli usque ad 2.5 cm. longi, indumento simul ac caules instructi. *Pedunculi* axillares, solitarii, fere 2.5 cm. longi, 1-3-flori, indumento ut caules; bractee lineares, usque ad 2 cm. longae, pilis longis pallide brunneis divaricatis instructae; bracteolae bracteis similes nisi minores. *Sepala* 5, e basi oblonga longissime acuminata, fere 2 cm. longa, basi 4 mm. lata, intus glabra, dorso pilis iis bractearum similibus instructa. *Corolla* 4 cm. longa, glabra, parte basali tubulosa circiter 6 mm. longa. *Filamenta* 1.1 cm. longa, ima basi pilosa; antherae 5.5 mm. longae, augustae. *Ovarium* glabrum; stylus filiformis, 2.3 cm. longus, glaber.

INDO-CHINA. Burma: Maymyo Plateau, 1050 m., *Lace* 5942.

829. *Edgeworthia longipes*, *Lace* [Thymelaeaceae—Euthymeleae]; ab *E. Gardneri*, Meissn., capitulo longe pedunculato facile distinguenda.

*Frutex* vel *arbuscula*, ramulis teretibus juventute pilis brevibus arcte adpressis instructis mox glabris cortice rubro-brunneo reticulato-striato obtectis. *Folia* alterna, oblanceolata lateve oblanceolata, apice subito breviter acutissime acuminata, basi in petiolum brevem vel brevissimum gradatim attenuata, usque ad 16.5 cm. longa et 4 cm. lata, membranaceo-papyracea, pagina superiore fere glabra, inferiore pallide viridia, pilis brevibus albis adpressis paucis praesertim ad costam instructa, margine saepe parum recurva, nervis lateralibus utrinque 10-13 supra conspicuis



infra prominulis. *Capitula* multiflora, circiter 4 cm. diametro, basi bractea solitaria vel bracteis geminis caducis foliis similibus sed his minoribus instructa, pedunculo folio opposito 9–11 cm. longo superne incrassato sulcato indumento simul ac ramulis suffulta. *Perianthii* tubus cylindricus, 1.5–2 cm. longus, extra sericeus, intus glaber; lobi 4, acute acuminati, 5–6 mm. longi, vivi lutei. *Stamina* 8, biseratim disposita, serie superiore ad tubi orem inserta antheris paulo exsertis, serie inferiore 3–5 mm. infra superiorem sita. *Ovarium* sessile, apice pilis longis albis erectis dense tectum, stylo superne glabro.

INDO-CHINA. Upper Burma: Ruby Mine District; Mogôk to Bernardmyo, 1500 m., *Lace* 6005.

830. ***Acalypha Lacei***, *Hutchinson* [Euphorbiaceae—Crotoneae]; affinis *A. Kerrii*, Craib, sed foliis crenato-dentatis nec serratis infra in nervis solis patule pilosis, bracteis florum ♀ dentato-lobatis differt.

*Frutex*; ramuli albescentes, subflexuosi, minutissime puberuli; internodii 1–2 cm. longi. *Folia* petiolata, late ovata, caudato-acuminata, basi rotundata, 5.5–12 cm. longa, 4–8 cm. lata, paullo crenato-dentata, dentibus oblique triangularibus subacutis, membranacea, sicco pallide brunnea, supra minute verrucosa et parce setosa vel fere glabra, infra in nervis et venulis patule pilosa, basi 5–vel sub-7–nervia, nervis lateralibus utrinque 4–5 arcuatis prominentibus intra marginem anastomosantibus, venis laxe reticulatis infra prominulis; petioli 1–5.5 cm. longi 1–1.5 mm. crassi, supra late canaliculati, infra sulcati, parce pubescentes; stipulae lineari-lanceolatae, acutae, 4–5 mm. longae, tomentellae. *Inflorescentiae* axillares, bisexuales, gracillimae, usque ad 6 cm. longae, floribus inferioribus feminibus 1–2 ceteris masculis; axis tomentellus. *Glomeruli* florum ♂ laxè dispositi. *Sepala* parce puberula. *Bractea* floris ♀ ambitu semiorbicularis, 4–5 mm. lata, 5-dentato-lobata, utrinque parce puberula, dentibus triangularibus subacutis. *Sepala* 3, ovato-orbicularia, obtusa, 1 mm. longa, 0.75 mm. lata, subcoriacea, extra superne et margine pubescentia, intra glabra. *Ovarium* setosum; styli liberi, 3 mm. longi, laciniati. *Fructus* non visus.

BURMA. Upper Chindwin District; opposite Kindat, 160 m., Aug., *Lace* 4232.

# LXXI.—GARDEN NOTES ON NEW TREES AND SHRUBS.\*

W. J. BEAN.

## xviii. (cont.)—NEW RHODODENDRONS.†

### *Rhododendron adenopodum*, Franchet.

The well-known French missionary, the Abbé Farges, appears to have first discovered this interesting and distinct rhododendron. In a letter to Kew, Mr. Maurice L. de Vilmorin, of Les Barres, informs us that he received seeds from the Abbé in 1901, collected in Eastern Szechuen. A plant raised from them flowered with Mr. de Vilmorin in 1909. It is very distinct among rhododendrons in its oblanceolate leaves, clothed beneath with a dense, brownish-white felt. On the plant at Kew (introduced by Wilson from Western Hupeh in 1904) the leaves are sometimes 6 in. long, but only about  $1\frac{1}{2}$  in. wide; smaller ones are 3 in. long by  $\frac{1}{2}$  in. wide. The flowers are produced, four to six together, in a loose truss. Corolla broadly campanulate, 3 in. wide, five-lobed, pale rose; calyx-lobes  $\frac{1}{2}$  in. long, oblong, ciliate; stamens ten, pubescent at the base of the filaments; pedicels and fruits hairy.

Mr. de Vilmorin compares the flowers to those of the hybrid *R. kewense*; the resemblance is seen in the loose truss, the widely-open corolla, and in its delicate rose colour. The bush grows as much as 10 ft. high; it is apparently quite hardy and a good grower.

### *Rhododendron argyrophyllum*, Franchet.

According to Mr. E. H. Wilson, who introduced this species to cultivation about 1904, it is one of the commonest rhododendrons in Western Szechuen, China. It is found there up to 20 ft. in height. The young shoots in the typical form are clothed with a loose scurf, but in some forms are glabrous or very soon become so. Leaves oblong-lanceolate, cuneate to rounded at the base, 3 to 6 in. long,  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. wide, glabrous above, clothed beneath with a close, compact felt; petiole about  $\frac{1}{2}$  in. long. The flowers are borne in a loose truss, about ten together; corolla broadly funnel-shaped,  $1\frac{1}{2}$  in. in diameter, shallowly five-lobed, white or slightly tinged with pink, with deeper pink spots on the upper side. The calyx is small, its lobes triangular; stamens twelve to fourteen, shorter than the corolla, the filaments pubescent towards the base; ovary pubescent; style glabrous; fruit about 1 in. long, slightly pubescent.

The species was originally discovered by the Abbé David, about 1885. It appears to be quite hardy, but grows slowly.

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\* *Ribes wollense*.—Since the description under this name of the shrubs growing at the Woll, Hawick, N.B., appeared in these pages (*K. R.*, 1914, p. 49), fresh flowers and further material have been examined. It now appears certain that the shrubs in question are not of hybrid origin, but belong to *Ribes divaricatum*, Douglas. The name *wollense* must therefore disappear. The plate also needs correction, and should read *Ribes divaricatum*.

† See p. 201.

**Rhododendron calophytum, Franchet.**

One of the most interesting things respecting some of the newly discovered rhododendrons of Western China is that they have made available to planters situated in the average climate of the British Isles several tree-like types, rivalling in stature and nobleness of foliage, those North Indian species, only hardy in our mildest counties. Most notable, perhaps, in this respect is *R. calophytum*, which Wilson found 50 ft. high in the forests of Western Szechuen, and of larger size than any other species native of that region. The largest leaves on adult trees are about 12 in. long and 3 in. wide, obovate to oblanceolate, acute at the apex, narrowly cuneate at the base; they soon become quite glabrous. Flowers in loose trusses, the corolla seven- or eight-lobed, campanulate, 2 in. wide, of some shade of pink. Wilson remarks that the scarlet pedicels add much to the beauty of the inflorescence. The stamens are glabrous, shorter than the corolla, sixteen or more in number.

Originally discovered by the Abbé David in Thibet, this species was first introduced to the Coombe Wood nursery in 1904. It is apparently very hardy at Kew.

**Rhododendron Davidii, Franchet.**

This species belongs to the fine group of rhododendrons whose leaves are quite glabrous and the corolla seven- to nine-lobed. This group includes *R. discolor*, *Fargesii*, *decorum*, *Fortunei*, *rotundifolium*, and others. *R. Davidii* was discovered by the Abbé David, after whom it was named, about 1885, and was introduced by Mr. E. H. Wilson to the Coombe Wood nursery in 1904. It is a bush eventually becoming 12 ft. high, its young shoots quite glabrous. Leaves oval-oblong, rounded to broadly cuneate at the base, mucronate, 3 to 6 in. long,  $\frac{3}{4}$  to 2 in. wide, dull yellowish green above, rather glaucous beneath. Flowers borne ten or more together in a terminal raceme as much as 6 in. in length. Corolla campanulate, about 2 in. wide, seven-lobed, pale purple spotted on the upper side. The calyx has rounded, ciliate-glandular lobes; stamens fourteen, with glabrous filaments; ovary glandular; pedicels more or less glandular.

*R. Davidii* has flowered at Kew several times during the last two or three years, usually in April. In its group it is distinct in the elongated common-stalk of the inflorescence.

**Rhododendron discolor, Franchet.**

For a long time the only true evergreen rhododendron (as distinct from *Azalea*) known in China was *R. Fortunei*, introduced by Fortune in 1859. Later discoveries made farther west have shown that this species may be regarded as the type of a well-marked group with large, smooth leaves, a six- or seven-lobed corolla, and twelve to sixteen stamens. To this group *R. discolor* belongs. It is a vigorous plant and was found by Wilson in Western Hupeh, sometimes 20 feet high. Its oblong leaves are 8 in. long and  $2\frac{1}{2}$  in. wide (considerably larger on young unflowered seedlings); petiole purple, stout, up to  $1\frac{1}{4}$  in. long. From the leaves of *R. Fortunei* they are well distinguished by having a cuneate instead of cordate base. The flowers have not yet appeared

on plants at Kew, but one blossomed at Coombe Wood in June, 1911. They are white tinged with pink or sometimes distinctly rosy pink, the funnel-shaped corolla being  $2\frac{1}{2}$  to 3 in. wide and six or seven-lobed. Stamens twelve or fourteen; the filaments glabrous, shorter than the corolla. Ovary and style glandular. Another distinction from *R. Fortunei* is provided by the ciliate margins of the calyx.

Wilson first introduced *R. discolor* from Szechuen in 1900 for Messrs. Veitch, who presented plants to Kew in 1908. Since then the same collector has sent large quantities of seed from Hupeh, so that this fine species is likely to become well represented in gardens.

### **Rhododendron Faberi, Hemsley.**

Originally described by Dr. Hemsley in the *Journal of the Linnean Society* in 1889 (vol. xxvi. p. 22) from specimens collected by the Rev. E. Faber on Mt. Omi in Western Szechuen, this distinct species was first introduced in 1904 by Wilson from the same locality. According to the collectors, it attains a height of about 20 feet in a wild state. The young shoots are covered with a brown, rather loose felt. The leaves are of hard, stiff texture, ovate-oblong to oval, 3 to 8 in. long, 1 to 4 in. wide; they are glossy dark green and glabrous above and the lower surface is usually clothed at first with a ferrugineous tomentum, which gradually becomes reduced to patches near the midrib; sometimes they are almost glabrous on both sides by autumn; petiole  $\frac{1}{2}$  to 1 in. long, brown-felted. The flowers are produced, six to twelve together, in trusses 3 in. wide. Corolla campanulate,  $1\frac{1}{2}$  to 2 in. wide and, according to Wilson, white or white spotted with red. Stamens shorter than the corolla, filaments hairy at the base; ovary and lower part of style glandular. The calyx is distinct in its large oblong or ovate, glandular-ciliate lobes, sometimes  $\frac{1}{2}$  in. long.

Living plants of *R. Faberi* are sturdy, healthy looking, and distinct in the large, stiff leaves with a yellow midrib; but the species has not yet flowered at Kew.

### **Rhododendron longesquamatum, C. K. Schneider. (*R. Brettii*, Hemsley and Wilson.)**

A bush sometimes approaching 20 feet in height, its young shoots thickly clothed with a curly, brownish red wool which extends also up the petiole and midrib of the leaf. Leaves up to  $5\frac{1}{2}$  in. long by 2 in. wide, obovate to oblong, pointed, rounded or slightly cordate at the base; except for the shaggy midrib they are glabrous. Flowers twelve or more in a truss; the corolla  $2\frac{1}{2}$  in. wide, five-lobed, open campanulate, pink with a dark red blotch. Stamens ten, shorter than the corolla, filaments pubescent towards the base. The calyx is very characteristic, being very deeply five-lobed, the lobes oblong-lanceolate,  $\frac{1}{2}$  in. in length, glandular and hairy. The calyx, together with the shaggy branchlets and midrib, make this species very distinct.

Discovered by Wilson near Tatien-lu, Szechuen, in 1903, and introduced by him to the Coombe Wood nursery. It appears to be quite hardy but slow-growing.



**Rhododendron pachytrichum, Franchet.**

This is a shrub or small tree originally discovered by the Abbé David and introduced in 1903 from Western China by Mr. E. H. Wilson, who found it as much as 20 feet high. From the older hardy rhododendrons it is well distinguished by the thick coat of pale brown, curly bristles that clothe the young shoots, petioles, and under surface of the midrib. The leaves vary from narrowly oblong to obovate and are 3 to 6 in. long, 1 to 2 in. wide, often cuspidate at the apex, rounded to cuncate at the base, glabrous above, the margins at first ciliate; petiole  $\frac{1}{3}$  to 1 in. long. I do not know that flowers have yet been produced in this country; possibly they have been in some of the gardens of the south-west. They are borne in compact trusses 3 or 4 in. across, and are said to vary from white to pale rose. The calyx is small, glabrous, its lobes triangular; corolla campanulate,  $1\frac{1}{4}$  in. in diameter; stamens ten, shorter than the corolla, the filaments pubescent at the base; ovary bristly; peduncles  $\frac{5}{8}$  in. long, bristly. Seed-vessel 1 in. long,  $\frac{1}{4}$  in. wide, slightly bristly.

*R. pachytrichum* reaches an altitude of 10,000 feet in Western China, and ought therefore to be able to withstand much cold. It has, however, been several times injured by late spring frosts at Kew.

**Rhododendron Przewalskii, Maximowicz.**

The famous Russian traveller, Przewalski, first discovered this species in the province of Kansu, W. China, in 1880, and it was introduced to cultivation by way of Petrograd. Wilson found it again, south of Kansu, and introduced it afresh in 1904. He remarks that in those regions it ascends to higher elevations than any other broad-leaved rhododendron, as distinct from the smaller-leaved, lepidote ones. He found it at an altitude of 14,500 feet. As represented in cultivation it is one of the dwarfest and most compact of rhododendrons; in twenty years it is only 2 to 3 feet high, although Wilson appears to have met with it up to 10 feet. Leaves narrowly oval to obovate, 2 to 4 in. long, 1 to  $1\frac{3}{4}$  in. wide, cuncate to rounded at the base, acute at the apex, glabrous above, usually scurfy beneath; petiole and midrib yellow, the former  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Flowers white or rosy pink, borne in compact trusses 3 in. wide. Corolla  $1\frac{1}{4}$  in. across, broadly funnel-shaped, five-lobed. Stamens ten, the filaments either glabrous or slightly pubescent near the base. The pedicels are about  $\frac{1}{2}$  in. long, and, like the small, slightly lobed calyx, the ovary and the style, smooth.

*R. Przewalskii* is apparently shy-flowering and has not yet blossomed at Kew. Its very close, dwarf habit suggests that it might be useful in the hybridiser's hands in establishing a dwarf race.

**Rhododendron strigillosum, Franchet.**

In its general appearance this rhododendron bears a considerable resemblance to the *R. pachytrichum* previously described. Like that species it is well marked by the bristly character of the young shoots, petioles and other parts. On the shoots the bristles

are  $\frac{1}{8}$  in. long, whitish becoming pale brown, usually gland-tipped. Leaves oblong-lanceolate, acuminate, cuneate to slightly auricled at the base, 3 to 6 in. long,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. wide, setose beneath, especially on the midrib; petiole  $\frac{1}{4}$  to  $\frac{5}{8}$  in. long. Flowers borne in trusses 4 in. wide, corolla campanulate,  $1\frac{1}{2}$  in. in length and width, rich red in the typical form, but said by Wilson to vary in colour from crimson to white. The stamens are ten, their filaments glabrous. The calyx, peduncle and fruit are all bristly, the last-named  $\frac{1}{2}$  to 1 in. long, cylindrical.

*R. strigillosum* is evidently closely allied to *R. pachytrichum*, but its leaves are of different shape and more hairy beneath, and the glabrous filaments give a ready distinction. It was discovered by David and named as long ago as 1886, but was introduced about ten years ago by Wilson. Like *R. pachytrichum* it is liable to have its young shoots injured by late spring frosts. We shall probably see it at its best in the Cornish gardens.

## LXXII.—ENCEPHALARTOS HILDEBRANDTII.

O. STAFF.

A proposal to publish illustrations of *Encephalartos Hildebrandtii* in the Botanical Magazine has necessitated a revision of the existing material of that plant in the Gardens, Museums and Herbarium at Kew as well as of the relative literature. In the course of the work some new facts worthy of record have come to light with regard to the history of the discovery of the plant, its distribution in East Africa and certain points of physiological interest. To a great extent they are based on observations recorded in the voluminous correspondence which Sir John Kirk carried on with Sir Joseph Hooker, and with Sir W. T. Thistleton-Dyer, whilst acting as Consul-General in Zanzibar. These observations constitute a valuable contribution to our knowledge of an interesting plant; their publication may serve as one more acknowledgment of Sir John Kirk's work as a keen naturalist, active observer and ever ready friend of Kew.

**Discovery and Distribution.**—On March 20th, 1868, Kirk announced to Sir Joseph Hooker the discovery of a new *Encephalartos* at Dar es Salam of which he had secured an entire plant. At the same time he sent home some pinnae of a leaf and some seeds. A cone, which was to have been brought home by the Rev. Mr. Wakefield, never reached its destination. The pinnae and the seeds which are still preserved in the Museum were, of course, insufficient for description. In 1870 a "root" followed, but although its receipt is duly recorded, it cannot any longer be traced and probably was found to be dead. Another plant forwarded that year seems to have had the same fate; but seeds received in September, 1870, germinated, and at least one of the plants thus raised is still alive. Long before the plants at Kew were large enough to be described, the species was rediscovered by the German traveller and collector, J. M. Hildebrandt, and was sent to Berlin and subsequently distributed in numerous specimens to various European gardens. The speci-

mens received at Berlin, imperfect as they were, were described at once by Professor Alexander Braun and the Curator of the Berlin Botanic Garden, C. Bouché, and named after Hildebrandt. This was in 1874.\* Subsequently when the plants had recovered from the journey and been supplemented by further material, more complete accounts were published by A. Braun† and Professor Eichler.‡ It is not exactly known where Hildebrandt collected his first specimens, and Braun and Bouché merely define the area of the species as covering "the coast of Zanzibar and to the north as far as Mombasa." In 1877 Kirk made a rapid journey to the outer Usambara Hills, opposite the island of Pemba, when he wrote (October 12th) to Sir Joseph Hooker: "The country on the march from the coast to the hills was like the maritime region of East Africa generally, the chief points of interest being the *Pandanus* of a species I do not recognise and the *Encephalartos* I sent you seeds of . . . I had imagined this *Encephalartos* to be beyond, rather to the mountains. I see at Tanga that it is rather native of the maritime plains, elevation from 200-500 feet only, on coral metamorphic limestone." Hildebrandt had meanwhile made several expeditions to Mombasa, and in his narrative,§ published in 1879, he stated that (in 1876) he found the hills (Jurassic limestone) near Shangamue, that is, between the Durum hills and the Fimboni Valley, about 12 miles N.W. of Mombasa, covered with short grass and Acacias and scattered plants of *Encephalartos Hildebrandtii*. "Their shining stems," he says, "rise to 5 m. The wide spreading, dark green crown of mucronate fronds protects the large fruiting cones, the farinaceous seeds of which serve as food in times of famine." The most striking plant associated with it in that region is the *Borassus* palm, whose columnar trunks attain double the height of the *Encephalartos*. In 1878 Kirk at last succeeded in sending home a male stem in good condition, 1 foot thick and 3 feet long, measuring with its fronds 12 feet. It came from Tanga, or from some point on the coast opposite Pemba. This specimen is still in vigorous health, the stem measuring 1 m. in height and 0.37 m. in diameter, whilst the fronds rise to 2.4 m. above it, being up to 2.25 m. long. At the same time he mentioned having been told of stems as much as 12 to 14 feet high, and in a later letter he speaks of having seen one 20 feet high and of great thickness, adding "it will cost a little to get them here and send them thence. I shall have to hire a native vessel and lower them with ropes, and it will require, I should say, fifteen or twenty men to each one, they are so thick and heavy." This giant he saw when at the north end of the island. Some months later (February, 1879) he returned there, and this is the account he gives of the singular condition under which the *Encephalartos* grows, illustrating it by a photograph of a whole plant in its habitat and another of the male and female cones collected on that

\* *Encephalartos Hildebrandtii*, A. Braun & Bouché, Ind. Sem. Hort. Berol. (1874) 8.

† A. Braun in Sitz. Ber. Gesellsch. Naturf. Freund., 1876, Oct. 17.

‡ Eichler in Monatschr. Ver. Beförd. Gartenbau, xxiii. (1880) 50.

§ Proceed. Geogr. Soc. xxii. 449, and Engl. Pflanzenwelt Ost.-Afr. I. A. 173.

occasion: "I have returned from visiting the north coast of this island (Zanzibar) with a view to sending to Kew one of the large Cycads (*Encephalartos*) I before told you of. Captain Earl, of H.M.S. "Linden," took me in a steam launch. We saw the trees standing out in the rocky shore, but had difficulty in effecting a landing, although it was at the time calm. The raised coral rock here stands 25 ft. above the sea, and is hollowed out to lean so that only at a chance spot was it possible to climb up, and then we were forced to use ropes. Once on the top it was equally difficult to move along, for near the coast the coral had been corroded into a number of spikes with sharp angles and cavities, into which it would have been most dangerous to slip. Farther inland these hollows were partially filled with red earth, so that it was easier to move about, but to transport a tree even of less size than those we had come in quest of, was clearly impossible with the means at our disposal over such dangerous and impracticable ground. We therefore selected one with a trunk 15 feet high clear of leaves, a male in full flower and with a crown of leaves that raised it 22 feet from the ground. This grew on the edge of the rock, so that we would not have to carry it over the spikes. It was soon found impossible, however, to take it off the roots, as these had filled every crevice of the rock holes. We cut it, therefore, off the rock, securing quite enough to enable it to grow without difficulty. Most unfortunately when the work was almost done it fell and snapped asunder on a rock, one-third from the top. The lower part we, however, took on board, and I have planted it on the chance that it may shoot out, as I saw many old trunks had done. After this we secured with great labour a small plant that had not yet flowered. The stem of this is about 5 feet high. This also I have planted here to give it a better chance of standing the voyage. I took a photo of a female tree 5 feet high in fruit. I have also taken one of the male and female cones which I sent. I also enclose a photo of the male and female cones of the Mombasa plant. The female cone in that is, however, unusually short. I hope the photos will be of some use as a guide. I am not sure that I shall have the full view of the *Encephalartos* in fruit printed in time to send now. It has a very peculiar habit . . . to that of the other Cycads, and the many fruits set at an angle are peculiar. The *Encephalartos* of the place we went to is singularly limited to those rocks. The country a few hundred yards back is open grass, but there not a specimen is seen. These rocky places contain many peculiar plants besides. I saw *Dorstenia*, an *Impatiens* and other plants, including the *Calumba* root that seemed to stand and enjoy the heat, the drought and the hard limestone rock. When next I go there it must be with better appliances and more time at my disposal. There must be the means of getting a mass of trunk a ton weight, over the sharp rocks without cutting the men." Yet no opportunity for repeating the expedition to those limestone cliffs seems to have arisen, and the *Encephalartos* inhabiting them remained undisturbed. Meanwhile Kirk had planted *Enceph-*



*alartos Hildebrandtii* in his country garden\* on the Island of Zanzibar, with the intention of having a "Cycad avenue," and it was thence, in 1884, that he sent to Kew the fine male and female specimens, from which the two plates, which are shortly to appear in the Botanical Magazine, were prepared. The correspondence on *Encephalartos Hildebrandtii* ceased with the letters advising the despatch of those stems.

Since then *Encephalartos Hildebrandtii* has been found to extend in Usambara as far inland as the upper Bombo Valley (45 miles from Tanga), so that Dr. Kirk's original surmise that it should extend "beyond rather to the mountains" was after all justified. Here, as well as in the drier parts of the littoral, it is associated with the candelabra-like *Euphorbia Nyikae*, *Sansevieria guineensis*, and an unnamed *Aloe*. Other recent records are from Rossako,† about 17 miles west of Bagamoyo and from the west coast of Zanzibar Island. Werth‡ alludes to it as a characteristic element of the bush formation of the young coral land of Zanzibar Island, "nowhere appearing in masses, but always in scattered individuals or small groups, in a short stem bearing wide dense crowns of spinous fronds." The area of this Cycad is therefore, as far as we know at present, confined to a narrow belt on the coast of East Africa, extending over about 200 miles from Dar es Salam to Mombasa. Within this belt the ground should be mostly limestone, either Jurassic or of young coral formations, and only where the belt attains to its greatest width, namely, in Usambara, would it be formed by gneiss or crystalline schists.

**Generation of Heat in the Male Cones.**—The fact that heat is generated in the male cones of certain cycads has been known for a long time. Teysman observed it in *Cycas circinalis* in 1849§ and Jul. Poisson in *Dioon edule* in 1878.|| Subsequently extensive and accurate records were obtained in 1894 by Professor Gregor Kraus¶ from *Ceratozamia longifolia* and *Macrozamia Miquelii* in Buitenzorg. In this connection it is interesting to note that Kirk had also observed the same phenomenon in *Encephalartos Hildebrandtii* in 1878, recording on one occasion a rise of temperature

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\* Sir John Kirk, to whom we have submitted this article, sends us the following letter with reference especially to his garden at Zanzibar :—

December 7th, 1914.

"It seems strange to go back and find extracts from my letters of many years ago still of use. I was not aware that Sir Joseph Hooker had kept my correspondence. I wish I had preserved the many letters he wrote me but papers soon get lost in the tropics amongst the many other interests that had to be attended to . . . In my experimental garden on the Island of Zanzibar . . . I had a wonderful collection of shrubs, trees and flowering plants which I acquired in exchange from many sources, India, Australia, as well as from England, and to this day that garden covering 40 acres still remains and the lofty Eucalyptus trees of several species, including the *citriodora*, the Mahogany tree, the Para and Ceara rubbers, the Brazil nut, etc., and all that flourish well are well cared for by Miss Thackeray who took the place over from me."

† Stuhlmann, Mit Emin Pascha, p. 824.

‡ Werth, Die Vegetation d. Insel Sansibar (Diss. 1901) 49.

§ Nederl. Kruidkund. Archief. i. (1850) pp. 109-114; ii. (1851) pp. 183-184.

|| Bull. Soc. Bot. France, xxv. (1878) pp. 253-254.

¶ Annal. du Jard. Bot. Buitenzorg, xiii. (1896) pp. 217-251.

of as much as  $16.5^{\circ}$  F. ( $9.15^{\circ}$  C.). This is what he said in writing to Kew on January 6th and 31st:—

January 6th.—“I have in my garden a plant of *Encephalartos Hildebrandtii* now in male cone. There are six cones close together in the crown, and last night when walking home with two in my hand, I noticed a strange fact worth noting and following up, both in this and other species. The cones were in paper—I had them in a bag, the sun had set, and there was nothing to disturb the temperature, but on taking them out to show some friends at home, I found them very hot. I placed them in a cloth with a thermometer that reached outside; the air was then  $81.5^{\circ}$ , and soon the cones rose to  $98^{\circ}$ , being  $16.5^{\circ}$  above the air. I left them there all night, and although they had been at an open window and exposed to the night air, they still were  $6^{\circ}$  above the air, which was  $80^{\circ}$ , while the cones showed  $86^{\circ}$ . They were then perfecting the pollen, which fell from the scales when shaken. I must try this on the cones when still on the plant, for those I observed with had been separated, but I doubt not this is a remarkable instance of heat generated as in arums at the time of forming the pollen. I have a male *Cycas* now coming on, and shall try it in that also.

January 31st.—“I have, since writing on the 6th inst., verified my observations on the temperature of the male cones of *Encephalartos Hildebrandtii*. The temperature is highest as the pollen is being matured and when the first can be shaken out. I have also made a practical experiment on the large male cone of our *Cycas* sp. Unluckily it has been brought to me when ripening the pollen, so that I have only an indication that the same phenomenon will be found in it. The rise of temperature was distinct. I have been very careful to avoid all chance of error, and this is rendered impossible by the small mass of the cone of *Encephalartos*, which could not retain solar heat inside and show as if it had originated heat. Besides, in the last stage of my experiment, there had been no sun all day, and the cone was quite cold and rose to its high temperature. I daresay all this is well known to you, but I have few works of reference here.”

***Encephalartos Hildebrandtii* and *E. villosus*.** Shortly after the publication of the first description of *Encephalartos Hildebrandtii* by A. Braun and Bouché, the validity of the species was questioned by E. Regel,\* and its identity with Lehmann's *E. villosus*, a native of Natal, suggested. No reasons for this reduction were then stated, beyond that “the fronds of more luxuriant specimens seen at Berlin, Cologne and Brussels pass into those of *E. villosus*.” A. Braun replied to E. Regel's criticism the same year,† pointing out the differences in the vegetative structure and in the female cones. According to him the stems of *E. villosus* are relatively stouter than those of *E. Hildebrandtii*, the petioles are thrown off earlier, so that the trunk appears armed by their persistent bases close up to the crown, the leaves are less hard and pungent, the teeth of the pinnae (4-9 on

\* In *Gartenflora* (1876), p. 204.

† A. Braun in *Sitz. Ber. Gesellsch. Naturf. Freund.* (1876), pp. 118-123.

each side, most frequently 5-6) more numerous, more distant near the base and more approximate towards the apex, pointing straight forward or spreading at a very acute angle. The head of the female scales, that is the portion of the scale which alone is visible in the entire cone and forms its surface, is in *E. Hildebrandtii* rhombic in outline, comparable to the apophysis of a cone scale of *Pinus*, sect. *Pinca*, with the hexagonal umbo rather lower down than in the conifer, whilst in *E. villosus* it is, although also rhombic, quite destitute of an "umbo"; to this may be added that in *E. Hildebrandtii* straight ridges radiate from the points of the umbo, whilst in *E. villosus* a downward curving transverse line divides the apophysis into a convex large upper field, lying in the plain of the surface of the cone and a smaller lower field sharply receding towards the axis; this line is, moreover, produced into a cartilaginous, toothed crest. A few years later Braun's differentiation was confirmed by Eichler,\* who was able to study the structure of the female cone on living material, one of the specimens received from Hildebrandt having at last produced flowers. Since then the two species have once more been declared by P. Hennings† to be identical. Hennings had observed in a nursery near Berlin a flowering female specimen of an *Encephalartos* which had been grown for years as *E. villosus* and appeared to be an intermediate between this and *E. Hildebrandtii*. According to Hennings, the intermediate character manifested itself in the pinnae, as well as in the cone scales. To illustrate his view he figures one pinna of typical *E. villosus*, one of the intermediate form and a number of pinnae of *E. Hildebrandtii*. This, however, seems hardly convincing, when regard is had to the circumstance that each frond possesses well over 190 pinnae, which not only vary according to the age and the vigour of the plant, but vary also within the same frond, according to their position on the common rachis. This being so, it is not difficult to pick out pinnae, which in shape are intermediate between those described as typical for either species. But taking the fronds as a whole, as they are represented by a number of living plants and of dried samples at Kew, I should say that A. Braun's differentiation is quite correct, except in so far as it relates to the leaves of young plants of *E. Hildebrandtii*—I have in mind a leaf of a ten-year-old plant raised from seed communicated by Dr. Kirk, which seems to resemble that of *E. villosus*, particularly in the shape, orientation and arrangement of the teeth. But placing adult plants side by side, there should be no difficulty in distinguishing the two species, even in the absence of female cones. In *E. Hildebrandtii* the fronds are borne on a cylindric, often much elongated stem, they are very rigid, their wool disappears early or is from the outset only moderately copious, their pinnae are very firm, those of the middle or just above the middle of the front are about 9-10 times as long as wide, the teeth usually are 3-4 in number on each side, are rigid, somewhat spreading with the uppermost usually distant from the apex. In *E. villosus*, on the other hand, the

\* Eichler in Monatschrift. d. Verein. z. Beförd. d. Gartenbau. xxiii. (1880), pp. 50-54, tab. 1.

† Hennings in Gartenflora, xxxix. (1890), pp. 234-238, with Abbild. 55.

fronds are borne on a short subglobose trunk, they are less rigid than in *E. Hildebrandtii*, their wool is more copious and persists longer, their pinnae are thinner, those of the middle of the frond are about 13-15 times as long as broad, the teeth are usually 4 in number on each side, with the upper ones close to the apex or they are almost absent, they are less rigid than in *E. Hildebrandtii*, and distinctly directed forward so as to be often parallel to the midrib of the pinna. As to the female cones the differences, as far as I can judge from the dried and spirit material at Kew and from drawings and photographs made at different times, are quite conspicuous and constant. It is true the toothing and crenulation of the transverse ridge of the apophysis of *E. villosus* may be obscure in some scales and the convex portion above this ridge may become flattened where it rises highest, the head of the scale assuming the shape figured by Hennings l.c. Abb. 55, fig. 2a; but these modifications are confined to the portions of the cone near one or the other end (the scale figured by Hennings was taken from the upper part) where the scales are generally reduced, or so modified as to lose somewhat of their characteristic appearance. In any case such flattened scales of *E. villosus*, with their entire transverse ridge, are still very different from those of *E. Hildebrandtii* with their polygonal umbo and the straight ridges radiating out from its corners, a character not sufficiently emphasized by Hennings' fig. 1.

It may finally be added that the male and female cones of *E. Hildebrandtii* vary considerably in size, and especially in length, and the male occasionally also in colour, so much so that Dr. Kirk was for some time doubtful whether there were not two species on the East coast of Africa; but in the end he came to the conclusion that this was not so, and the examination of the Kew material certainly supports this view. Both suspected forms are represented by living males at Kew, one producing cones up to 42 cm. by 10 cm. with greenish-brown apophyses and pale brick-red claws, the other bearing cones not much over 20 cm. long and 6 cm. in diameter and brick-red all over. Apart from these dimensions and colour differences, there is nothing in the plants to allow of discrimination.

### LXXIII.—MISCELLANEOUS NOTES.

MR. R. A. ROLFE, A.L.S., an Assistant, Second Class, in the Royal Botanic Gardens, Kew, has been promoted to the grade of Assistant, First Class, with effect from November 6th.

MORDECAI CLIBITT COOKE.—It is with sincere regret that we have to announce the death, in his ninetieth year, of Dr. M. C. Cooke. Dr. Cooke had charge of the Lower Cryptogams in the Herbarium from 1880 till 1892, during which time he completely re-arranged the fungi, incorporated large collections, and published the most important of his works, "Illustrations of British Fungi." Extraordinarily industrious he accomplished during his long life an



enormous amount of work. He retained, long after his retirement, a keen interest in fungi, but of late years his eyesight failed, and a few months ago he left his old home at Kentish Town to live with a married daughter at Southsea. Here he passed away on November 12th.

An account of Cooke's life and scientific work will be found in the *Kew Bulletin* for 1912 p. 369.

A. D. C.

**SIR JOSEPH DALTON HOOKER.**—We learn that a Wedgwood medallion portrait of Sir Joseph Hooker has been placed in the Hall of the American Philosophical Society at Philadelphia, and that it was unveiled by Dr. W. G. Farlow at the meeting of the society held on April 25th last.

We have also received from Lady Hooker the following letter written from the Ito Botanical Institute, Tokyo, on September 19th, 1914:—

Dear Madam,

I have the honour of sending you a copy of the latest number of the "Gakusei" (The Student, Vol. v. No. 10, Sept. 1914), in which you will find a short sketch of the biography of your illustrious husband—the late Sir Joseph Dalton Hooker. Sir Joseph has been recently selected by the contemporaries in Japan as one of the Twenty-Nine Heroes of the World that Modern Time has produced. That essay is, I am glad to tell you, the first detailed account of the life of the great botanist hitherto published in Japanese language. We thank you for the beautiful portrait of your illustrious husband, of which you were so kind as to send me some time ago and with which my essay is duly embellished. That portrait always recalls me the likeness of that of my old grandfather, the late Baron Keisuke Ito, the founder of modern botany in Japan, who died some years ago at the age of ninety-nine.

With best wishes of your good health,

I remain,

Yours respectfully,

TOKUTARO ITO.

Lady Hooker,  
The Camp,  
Sunningdale.

**Mr. Chamberlain and Kew.**—The following note by Sir W. T. Thiselton-Dyer has been published in the *Gardeners' Chronicle*. It explains more precisely the occurrence which is described in a note by Mr. Austen Chamberlain published in *K. B.* 1914, p. 298:—

"Mr. Austen Chamberlain is not quite accurately informed as to the history of the completion of the Temperate House at Kew. Mr. Chamberlain wished to see this accomplished, and Kew wanted to extend its cultivation under glass. The moment seemed favourable and I addressed a memorandum on the subject in the

usual way to the Office of Works. The First Commissioner (now Lord Gladstone) approved the proposal, and caused an estimate for the erection of the South Wing to be included in the next year's estimates and submitted to the Treasury. It was agreed to in principle, but at the last moment the item was struck out by the Chancellor of the Exchequer, and the Office of Works informed me accordingly. I did not regard this as an abandonment of the project, but only a temporary postponement such as is not infrequent on financial grounds in official work, even in cases of necessity. Nor did I make any appeal to Mr. Chamberlain: that would have been quite irregular in a matter in the hands of a Minister of the Crown. Mr. Chamberlain acted independently and happening to dine at the House of Commons with the Chancellor of the Exchequer induced him to reverse his decision. The First Commissioner was dining at another table, and Sir William Harcourt authorised him verbally to have the work proceeded with at once. A supplementary estimate supplied the necessary funds."

**Kew and the War.**—Since the publication of the figures giving the number of the members of the Kew staff serving with His Majesty's forces on land and sea, seventeen more men have volunteered their services or have been summoned as members of the National Reserve.

Three National Reservists, belonging to the uniformed section, have been called out, six ex-soldiers, three being from the uniformed section and three from the labour force, have rejoined the ranks, and ten young gardeners and the packer have enlisted either in the New Army, the Territorial Force or the Naval Reserve.

The total number of men from the Royal Botanic Gardens now serving with the forces is thus sixty-six.

**Botanical Magazine for December.**—The plants figured are *Clematis Armandi*, Franch. (t. 8587); *Pleione pogonioides*, Rolfe (t. 8588); *Crataegus pubescens*, Steud., forma *stipulacea*, Stapf (t. 8589); *Salvia longistyla*, Benth. (t. 8590), and *Ceratostigma Willmottianum*, Stapf (t. 8591).

The volume for the year which concludes with this number of the Botanical Magazine is dedicated—"To Professor Henry Harold Welch Pearson, M.A., Sc.D., F.L.S. Harry Bolus Professor of Botany, Cape Town, and Director of the National Botanic Garden of South Africa, as successful in his leadership of botanical expeditions as he has been generous in distributing their fruits."

The *Clematis* is a vigorous and handsome species for the introduction of which we are indebted to Messrs. James Veitch & Sons through their collector, Mr. E. H. Wilson. It is rather widely distributed in China, occurring in Hupeh, Szechuan and Yunnan, at altitudes ranging up to 5500 ft. above sea-level. Two forms are in cultivation, and the finer of these is the subject of the illustration, which was prepared from material supplied from the garden

of Sir William T. Thiselton-Dyer, at The Ferns, Witcombe, Gloucester, where the plant made a fine display in April. It is a hardy evergreen climber, with large leathery trifoliate leaves, and showy axillary cymes of white fragrant flowers. It is allied to *C. Meyeniana*, Walp., from which it may be easily distinguished by the presence of a rosette of scales at the base of the inflorescences.

The pretty *Pleione pogonioides* was originally described in 1896 under the name of *Coelogyne pogonioides*, Rolfe. It was first collected by Mr. T. Bullock in the province of An-Hwei and afterwards by Mr. Augustine Henry on mountains near Patung in Hupeh. Living plants, which do not appear to have flowered, were sent to Messrs. Veitch by Mr. Wilson. Bulbs were received from China in 1912 by Messrs. Charlesworth & Co., of Haywards Heath, and the first flowers were produced in February, 1914, when material was sent to Kew for identification and was used in the preparation of the figure. This species and *P. yunnanensis*, Rolfe, figured at t. 8106 of the Botanical Magazine, are the only Chinese *Pleiones* in cultivation.

The *Crataegus*, represented in the illustration by a form in which the leaves and stipules are larger than is usual in the species, is the well-known Mexican Hawthorn or Tejocote, which is valued, especially by the Indians of Mexico, for its fruits, of which a national conserve is made. It has a long history, being mentioned in the writings of Hernandez, who lived in Mexico between 1571 and 1577. In 1825 it was described by De Candolle as *Crataegus mexicana*, two years after Humboldt and Bonpland had published a description of it as *Mespilus pubescens*. It appears to have been introduced into England about 1824 by the eighth Lord Napier, through his friend A. B. Lambert. A tree at Kew, now about 15 ft. high, was received from the Jardin des Plantes, Paris, in 1891. It is quite hardy and is one of the finest Hawthorns in cultivation.

*Salvia longistyla*, a Mexican species, resembles *S. coccinea*, Linn., but its leaves and flowers are larger and the bilobed calyx has long acuminate lobes. In height it is extraordinary, the Kew plant being 14-15 ft. high after nine or ten months' growth. It flowers during the winter, and where sufficient space could be given to it a plant would make an ornamental feature in the conservatory. The figure was prepared from material obtained from the Kew plant, which was raised from a cutting presented by Dr. Robertson-Proschowsky of Nice.

The *Ceratostigma* is a new species which has been described and figured from material sent to Kew by Miss Willmott, who has two plants, now shrubs five feet high. It resembles the well-known *C. plumbaginoides*, Bunge, often known in gardens under Lindley's name of *Plumbago Larpentae*, but it is larger and looser in habit, and differs in several less striking characters. The home of *C. Willmottianum* is Western China, where it was collected by Mr. E. H. Wilson for the Arnold Arboretum.

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**North Gallery, Official Guide.**—A revised and augmented edition of the Official Guide to the collection of paintings at Kew

by the late Miss Marianne North has just been issued. This forms the sixth edition since the original issue in 1882. A good deal of revision has been made in the descriptions of the plants from India, Ceylon and the East, and several additional determinations have been added. In nearly every case it has now been possible to identify exactly the plants depicted. The catalogue of the woods forming the panelled wainscot below the paintings has also undergone considerable revision and the majority of the timbers have now been identified.

**The Cocoanut.\***—The appearance of a new book dealing exclusively with the cocoanut palm indicates how great are the interests centred in the tree, for other modern books upon the same subject are in circulation. This latest work is by Mr. Edwin Bingham Copeland, Professor of Plant Physiology and Dean of the College of Agriculture, University of the Philippines, and has been written with a view to directing attention to the position occupied by the cocoanut in the Philippines and as an indication of the system of instruction upon the cocoanut and its uses imparted to students at the University. The preparation of the work was commenced in 1907, and it contains the results of Mr. Copeland's scientific and practical investigations between that date and the present.

After an introduction of some half-dozen pages, which deals in a general way with the cocoanut and its distribution, the author devotes a chapter to an interesting description of the physiology of the plant, in which he gives details of personal observations and of experiments conducted by his students. The next chapter deals with climate, soils and manures, and is followed by a chapter on diseases and pests. The chapter on the latter subject takes up 77 pages and deals exhaustively with fungus and insect enemies. Descriptions of the various diseases and pests are given, together with the results of investigations into their distribution and eradication.

Varieties of cocoanut, the selection of seed trees, and seed germination form the text of the next chapter, and it is followed by a lengthy chapter on field culture. In this the advantages and disadvantages of catch crops in young plantations are discussed. The concluding chapter deals with cocoanut products, full particulars of the preparation, with analysis when necessary, of toddy, sugar, arrack, vinegar, coir, copra and oil being given. Twenty-three illustrations add to the interest of the book and it is concluded by a good index.

The book throughout is full of interesting and instructive matter, which is presented in clear and easily understood language, and it can be confidently recommended, not only to intending planters, but to all who wish to learn about the cocoanut and its uses.

W. D.

\* The Coconut. By Edwin Bingham Copeland, Professor of Plant Physiology and Dean of the College of Agriculture, University of the Philippines. London: Macmillan & Co., Ltd.; pp. 206; 23 illustrations; price, 10s. net.



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